

**DAGRYOCYSTITIS : BACTERIOLOGICAL  
STUDY AND ITS RELATION WITH  
NASAL PATHOLOGY**

**THESIS**  
FOR  
**MASTER OF SURGERY**  
(OPHTHALMOLOGY)

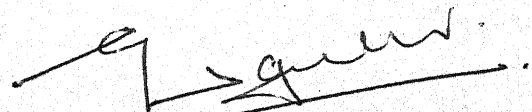


**BUNDELKHAND UNIVERSITY**  
**JHANSI (U. P.)**

C E R T I F I C A T E

This is to certify that the work entitled "Dacryocystitis : Bacteriological study and its relation with Nasal Pathology", which is being submitted as thesis for M.S. (Ophthalmology) examination of Bundelkhand University, 1990 by Dr. Mahesh Chandra Agarwal, has been carried out under our guidance and supervision. The techniques and statistics used, were undertaken by the candidate himself.

He has put in necessary stay in the department as per University regulations.



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Today, when I am going to submit my thesis work, I am not able to express my sincere feelings for those who helped, guided and encouraged me through out the work period. So I am in confrontation when words find themselves unable to express what one feels in the depth of ones heart.

Same situation paralysis my thoughts when I find no words in the literature to express my deep sense of gratitude and humble thanks to my esteemed and learned teacher Dr. G.D. Gupta, M.S., D.O.M.S., Reader and Head of the Department of Ophthalmology, M.L.B. Medical College and Hospital, Jhansi, who with his over whelming knowledge and experience, untiring rest for work guided me through out this humble venture. His firm initiative, timely and constructive criticism, invaluable guidndce, divine inspiration and above all a benevolent attitude went a long way towards completion of the present task. His pains taking efforts to mould this work to a fine illustrated shape will always remain as an unforgettable memory in my life.

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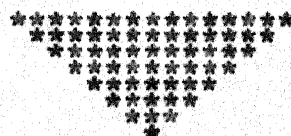
I will be failing in my duty if I do not express my thanks to Mr. R.S. Vishwakarma for his meticulous care and pains taking labour to bring out this neat type script.

Dated: August, 30, 1989.

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## C O N T E N T S

	<u>Page no.</u>
INTRODUCTION .. ..	1
REVIEW OF LITERATURES .. ..	5
MATERIAL AND METHODS .. ..	31
OBSERVATIONS .. ..	43
DISCUSSIONS .. ..	56
SUMMARY AND CONCLUSION !. . .	71
BIBLIOGRAPHY .. ..	I - IX
APPENDIX .. ..	A - E
SUMMARY .. ..	Separately attached





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**I N T R O D U C T I O N**  
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## INTRODUCTION

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Dacryocystitis is a very common and unpleasant disease presenting a constant source of trouble to both patient as well as doctor. Because, it leads to conspicuous and troublesome symptoms and it has a very little tendency to resolve itself. Its adequate treatment also presents problem and disease usually leads to disfigurement of the face to a varying degree, causing a great concern in our curriculum.

This disease covers a wide range of age groups from newborn to the old, although it is predominant in middle age and usually females. The epiphora, which is a universal symptom of the disease, is very annoying particularly to the females with cosmetic embarrassment.

The disease dacryocystitis has been known from the earliest time owing to its greater manifestations involving abscesses and fistula on the face but was interpreted variously as a defluxion from the brains or a rottiling of the naso-orbital bone. The term dacryocystitis includes all the swelling of the inner canthus upto that time.

Dacryocystitis is the inflammation of lacrimal sac and duct. There is stagnation of the sac contents due to obstruction of the nasolacrimal duct. It forms a ready site for congestion where slight infection once established, will settle. The stasis is invariably followed by infection and when this infection is settled it leads to more obstruction of nasolacrimal duct and more stasis. Thus vicious circle is set up. The infection reaches from conjunctiva or from nasal mucosa. The wall of the sac becomes chronically inflamed and almost atonic. The contents of the sac are at first watery, later on mucoid, due to excessive secretion of mucous by the goblet cells and afterwards mucopurulent, due to exudation of pus cells.

Chronic dacryocystitis is commonly attributed to the effect of obstruction of the nasolacrimal duct arising from chronic inflammation usually of conjunctival or nasal origin. The obstruction of the lower end of nasal duct may also be caused by the pressure of extreme deviation of the nasal septum, hypertrophy of inferior turbinate bone or chronic rhinosinusitis and so on.



Apart from discomfort and social inconvenience its perpetuation tends to inaugurate a vicious circle in that a chronic irritable lacrimal conjunctivitis is produced and some times an eczematous condition of skin and lids both of which aggravate the initial condition and make its relief more difficult.

So the condition never undergo resolution, and at any time an acute inflammation may arise leading to the formation of lacrimal abscess and untreated cases are converted into external lacrimal fistula.

It may occur in newborn also. In these cases it is generally due to imperfect canalization of the epiphelial cord in which the nasolacrimal duct is formed. Such cases may be rarely due to tuberculosis, leprosy or syphilis, usually originating from the surrounding bones.

The aetiology of any disease resolves into two factors, the direct and the indirect. In other words there are some predisposing causes and some direct causes which lead to a disease. The former includes the age, sex, race, geographical and socio - economic

condition, the anatomical and physiological considerations whereas the later mainly comprises of infections by various organism and its origin, trauma, neoplasm and congenital anomalies.

In addition to above we see the effect of disease in untreated cases also. Non - treated cases of dacryocystitis may affect the cornea. Minute abrasions of cornea are liable at any moment to become infected and may give rise hypopyon corneal ulcer. There is always the risk of panophthalmitis if any intraocular surgery is undertaken of this time, by mistake.

The present study is undertaken to evaluate the role of bacterial flora of conjunctiva and nasal pathology in chronic dacryocystitis.

REVIEW OF LITERATURE

## REVIEW OF LITERATURE

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The disease dacryocystitis has been known from very early times, owing to its grosser manifestation involving abscess and fistulae on the face but was interpreted variously as a refluxion from the brain or a rotting of the naso-orbital bone.

First discovery of disease of lacrimal passage (dacryocystitis) is mentioned in the literature was done in the middle of the first century A.D. General term ( ( ἰσχυρὸς ) oegilops, a fistula). Vasalins and Follopins described the lacrimal system with considerable accuracy.

In year 1702, George E. Stahl of Halle gave gross pathological manifestations of the lacrimal sac were shown to depend upon inflammation, not of the tissue generally but of the nasolacrimal canal, these manifestations taking any of three forms -

- Acute
- Chronic
- Hydrasis or ulceration with fistula.

The age is variable ranging from immediate postnatal period to fifth decade. Traquair (1941) described the maximum incidence at the age of round 50 years, while according to Duke Elder (1952) the incidence is maximum between the period of 40 - 60 years of age. Reddy et al (1955), Chatterjee (1955) and Agarwal (1961) found the highest incidence of the disease in the fifth decade.

Malik S.R.K. et al (1969) found that the highest incidence of age in female was in 4th decade average 35.9 years and range was 12 - 80 years. The average age in males was 23.8 years range 11 - 72 years. The highest incidence occurred in the late twenties.

Bale R.N. (1987) observed that the maximum incidence of age was over the age of 30 years nearly 78%. Amongst this the peak was at 5th decade of age 26%.

As regards the sex incidence it was found by all the observers that the disease is much more common in females. Traquair (1941) found 83% female and 17% male cases in his series while Skill (1949) observed



the male female ratio to be 30 : 70. Other observations like Duke Elder (1952), Chatterjee (1955) and Reddy et al (1955) found more or less the similar ratio.

Sex ratio was studied by Delgliesh (1967) also. He described that 7% of male and 20% of females gave history of one or more episodes of dacryocystitis in cases of nasolacrimal duct obstruction similarly the history of dacryocystitis combined with obstruction is present in 40% of males and 58% of females. He also described that 1/3 of patient shows bilateral condition 30% males and 32% females.

Malik S.R.K. et al (1969) studies in 169 cases of dacryocystitis and they found that the disease is 81.7% in female & 18.3% in male and in female average is 35.9% and male 23.8%. Bale Rajeev N. (1987) found male female ratio is 43 : 57.

Heinonal (1920) associated described about the high ratio of disease in female because of it with high nasal index ( $\text{width} / \text{height} \times 100$ ), while Meller (1929) mentioned that it is due to the narrower nasolacrimal canal in the females.

Regarding the socio-economic status Chatterjee (1955) and Reddy et al (1955) observed that the disease is more prevalent in poor patient (70%) probably due to unhygienic surroundings. Rosley S. and John (1967) reported that 75% common in poor class due to unhygienic condition and poor sanitation.

Veris (1955) observed that the disease was dominating in left side eye 66% over the right side 34%. The affection of side was found by Sood et al (1967) as 50% each right and left. While Malik S.R.K. et al (1969) studied 169 cases and found left side affection in 99 cases 58.8% and right side in 70 cases 41.2%. Bale Rajeev N. (1987) observed in 100 cases and he found the left eye affection 51.04% and right side was 48.96%.

Bilaterality observed by many authors i.e. Deglish (1967) found unilateral, bilateral ratio 66:34. Traquair (1941) observed 70:30. Malik S.R.K. (1969) found 74:26 and Bale R.N. (1987) studied 100 cases and found 57% unilateral and 43% bilateral.

Heredo - familial character of the disease has been noted by various observers like Schnyder (1920), Traquair (1941) and Jackson et al (1963) noted that it is transmitted as a dominant character in both males and females. Fernandez (1919) believed that narrowness of the nasolacrimal canal is responsible for higher incidence of the disease in white races as compared to negroes.

Some observers reported that the anatomical difference may cause the disease frequently. Onoda (1913) observed that a spur on the anterior or posterior lacrimal crest or a well developed hamular process may constrict the lacrimal sac and may lead to frequency of disease. Baratta (1935) noted that the deformity of the nose and maxilla or fracture of the maxilla may completely block the nasal canal and lead to dacryocystitis.

Mechanical obstruction had been found in a large number of cases. Hypertrophied inferior turbinate bone had been observed by Post (1928) and Veris (1955).



Deviation of nasal septum was observed by Stenger (1916), Kaflar (1930) and Bockstein (1926), Traquair (1941) and Rutz (1972). They reported that deflection of nasal septum compress the structure against the lateral nasal wall and may result the obstruction of lower end of nasolacrimal duct.

Ruttin (1916) and Kefler (1930) found that even packing of the nose with guaze resulted in chronic dacryocystitis in same cases.

The allergic condition like chronic rhinosinusitis is also responsible for the dacryocystitis, both specifically and non specifically. In specific condition of chronic sinusitis the rhinoscleroma is one of the cause as reported by Badrwy R. (1962). He said that in the IIIrd stage of rhinoscleroma, the obstruction of lacrimal gland may occur. Darbari and Saxena (1961) study 42 cases of rhinoscleroma and they found obstruction of lacrimal gland in 24 cases.

The disease of the neighbouring structures bear an important role in the aetiology of the disease. The significance of nasal infection had been stressed by several authors Kuhut (1891), Galls (1904), Meyer (1909),

Peterson (1914), Robert (1954). On the other hand a number of observers disagree with this view and regard it as a coincidence and not due to the infection of neighbouring structures. Those authors were Bockstein (1926), Traquair (1941).

Rhinosporidiosis is common in agriculture communities in India and responsible for the dacryocystitis as reported by Kuriakose in 1963 and Purendre and Deoras in 1953.

Mukherjee et al (1928) in study of 414 cases of dacryocystitis during 2 years, got 48 cases of dacryocystitis due to rhinosporidiosis and in out of these 48 cases the sac ( only ) was involved in 42 cases and sac with nose in 6 cases. Walter, Straford and Havell in 1956 reported that the candidiasis also cause the obstruction of lacrimal duct due to candida albicans.

Jain H.R. and Sahai (1974) gave a report of ocular fungal infection in which the involvement of lacrimal sac is 24% and canaliculi is 4% caused by rhinosporidium seeberi which was first described by seeber (1900). He suggested that the disease is common in agriculture people.

David S.S. and Sivarama Subramanyam P. (1973) studied 21 cases of rhinosporidiosis and in which found 13 males and 8 females and 76.2% cases conjunctival involvement and in 28.6% cases lacrimal sac involvement. All the patients belong to agriculture community.

Susheela V. and Subramaniam (1975) noted that disease is common in agriculture people of India eg. W.Bengal, Bihar, Orissa, Maharashtra, Madhya Pradesh, Kerala etc. They studied in 49 cases of maximum age of 15 - 25 years and male - female ratio is 2%. In which he found seven cases of lacrimal sac involvement with lesion of nose also.

Krishnan Mathew M. et al (1986) found a case of diverticulum of lacrimal sac associated with rhinosporidiosis.

The infection of lacrimal sac may be due to spread of gross infection from local condition involving the conjunctival, nasal cavity and sinuses. It may also be due to systemic disease. Such as tuberculosis, leprosy, syphilis etc. as described by Traquair (1941) and Anderson S.R. (1947).

It is also occurred by trachoma, eg. trachomatus dacryocystitis - extension of sub-mucous trachomatous infiltration from conjunctiva may involvement of the canaliculi and so sac may also affected. Charmis (1957), Postic (1957), Vali et al (1972), Dawson C.R. (1975) and Tabara et al (1980) and so many other.

Charles D. et al (1988) performed lacrimal sac biopsies and culture in 35 patients of nasolacrimal duct obstruction and found trachoma due to presumed chlamydial infection in 28 cases. In their opinion approximate 60% of patient of severe infective trachoma have either distal nasolacrimal duct or canalicular obstruction.

Dacryocystitis is secondary to tuberculosis infection commonly due to nasal origin in which direct

spread of nasal lump the usual cause indeed, weeping owing to a sec. dacryocystitis not uncommon, described by Caboche (1907). He found 13 cases of lacrimal involvement duct of 24 cases of nasal disease.

Rollet (1911) and Kemler (1930) observed that nasal lump may cicatrize the lacrimal ostium and due to it dacryocystitis is result.

Anderson and others in 1947 described that the secondary tuberculosis may give rise to the nasal infection and it affect the sac, then leading to dacryocystitis. They studied 19 cases of tuberculosis infection of nose and found 4 cases of dacryocystitis due to secondary to that.

Wearakoon in year 1969 found 14 cases of lacrimal obstruction among 247 cases of leprosy with ocular complication in Ceylon.

Wetzel (1945) reported that the tertiary stage of syphilis is also responsible for the disease.

The rare cause of lacrimal passage obstruction is granuloma of sarcoidosis as described by Neawlt and Roley in 1970,



Lacking of complete canalization is also responsible for the chronic dacryocystitis as reported by Cassady J.V. (1948), Jackson et al (1963) and Agarwal J.L. (1972).

Reddy et al (1955) stated that epiphora, depending on the severity of obstruction was the commonest and earliest symptom to begin with. They found epiphora in 80% cases. The regurgitation of fluid on pressure was other most common finding observed by them in their series. Jones L.T. (1957) and Jacobs H.G. (1959) found epiphora in 94% cases.

Chronic infections of nose and throat with enlarged tonsils and adenoids were found to be the cause by many authors like Post (1928) and Gaynon I.E. (1962).

The infection may be specific like tuberculosis, syphilis, leprosy and rhinoscleroma or it may be non-specific. Atrophic rhinitis had been determined in several cases, Heilmair (1890) found atrophic rhinitis in 136 cases out of 352 cases of dacryocystitis.

The sinusitis also plays an important role as an aetiological factor of dacryocystitis as described by some observers like Kuhut (1914), and Garfin (1942). According to them the infection travels by veins or lymphatics by continuity of contiguity.

Other authors like West (1926) and Diggle (1927) disagreed with this hypothesis.

Conjunctival infections were thought to be other common and important source of disease but Duke Elder (1952) described that although they comprised an important but certainly a rare cause.

Some viral infections like traucoma, viral Kerato conjunctivitis and phlectenular conjunctivitis are more common to spread the infection and responsible for dacryocystitis as described by Sanyal and Mitra (1967).

General infection have also been described as a rare cause of this disease. Few recorded cases and believed the infection to be blood borne. Thus Murgailen and Morenon (1923) found dacryocystitis in influenza, diphtheria and small pox. Kofler (1928) believed that some of these cases are due to associated rhinitis. Infections from septic teeth had been observed by Kemler (1931). Sigelmen and Muller (1961) has described one case of tuberculosis of the sac.

Fungal infection of the lacrimal sac has also been described. Fine & Waring (1937) reported a case of dacryocystitis due to candida albicans. Toluant (1941)

reported 23 cases of ocular spirotrichiasis of which one was of the lacrimal sac obstruction Rosley et al (1967) reported one case of aspergillus of lacrimal sac. Actinomycosis infection was reported by Joseph T.A. et al (1980), Darbari and Saxena (1961) reported one case of seloroma. Ellis (1941) reported 25 cases of ocular rhinosporodiosis of which three were of the lacrimal sac involvement. Purandare and Deoras (1954) reported two similar cases.

Some cases of trachomatous dacryocystitis were also reported. Charmis (1957) discussed trachomatous involvement of lacrimal sac. Trachomatous infection of drainage system is common at puncta and less common in further downwards structure of lacrimal system. Histo - pathological changes of puncta, canliculai and lacrimal sac are similar to those of conjunctival trachoma. Microscopic changes resulting from trachoma differs from those of dacryocystitis in general.

Dagglas J. Coster et al (1979) studied 20 cases of dacryocystitis due to canaliculi obstruction by Herpetic infection.



Robert F. Sanke et al (1982) found 3 cases of dacryocystitis due to chicken pox infection but all of unilateral. A dacryocystitis revealed obstruction of the common canaliculal in each case caused by a fibrotic scar followed by an attack of chicken pox.

Feruick C Riley (1969) observed the dacryocystitis is due to back's sarcoid. He suggested that due to it stains of the component of lacrimal sac resulted dacryocystitis.

A case of malignant melenomâ of lacrimal sac was reported in a 69 years old man complaining of epiphora and bleeding. A case of cercinoma of lacrimal sac has been reported and another of a papilloma of lower end of lacrimal canaliculal attached to the canaliculal by a single pedicle. Surprisingly the patency of drainage system was maintained in the later as shown radiographically that pedicle did not interfere with and mucopurulent plug. The relationship between infantile dacryocystitis and delayed formation of nasolacrimal duct was described by some authors like Kramer (1922), Cassady (1948), Duke Elder (1952) and Mann et al (1957) suggested that failure of rupture of nasolacrimal membrane at the lower end of duct which usually occurs at the time of birth may be the cause.

Agarwal M.L. and Gupta B.P. (1976) studies a series of 45 cases of dacryocystitis and found the stenosis, fibrosis of the sac or block mostly at the junction of sac and nasolacrimal duct.

Efooks (1959) and Jackson et al (1963) showed that in the most of the cases (50.75%) the membrane at the lower end of the nasolacrimal duct ruptures at the time of birth, so the incidence of inflammation of sac is less (0.5 - 5%).

The bacteriological studies in cases of chronic dacryocystitis had been shown by Rollet and Bussy (1923), Traquair (1940), Reddy and Reddy (1955), Simpson and Tazer (1958), Ram and Prasad (1958), Lo casio (1963), Jannison et al (1961) and Bale R.N. (1987) ' Gutierrez E.H. (1972).

The bacteriology of chronic dacryocystitis is of nasal type rather than conjunctival type eg. E.Coli, Pneumococci, Proteus, Pseudomonas. But the conjunctiva often shares the same flora as reported by Chaterjee in 1955, Sood Ratanraj and Balaraman (1967) and Traquair in 1941.

Staphylococci colonised in the nose of infants during first few days of life 64 - 100%. High incidence of conjunctival infection also recognised in infants. Pneumococcus was found to be the most common organisms ( Duke Elder 1952). It occurred in pure form or associated with other bacteria and was seen both in acute as well as in chronic forms.

Other organisms which were found to be responsible by these authors were staphylococcus, streptococcus friedlanders bacillus, influenza bacillus, diplobacillus, E. Coli, bacillus fusiformis, typhosus, B., Koch's bacillus, B. retragenes, K.L. bacillus, Diphtheroids, proteusvulgaris, micrococcus catarrhalis and mycotic organism.

Rollet and Bussy (1923) studied 100 cases of dacryocystitis in which pure infection was found in 60 cases and mixed infection in 14 cases the remaining 26 cases being sterile. In mixed infection staphylococcus predominated.

Reddy and Reddy (1955) found 15% cases sterile in their series in which they found 52% pure infection and 33% mixed infection and staphylococcus was the common organism.

Ram and Prasad (1958) found 86 cases of pure (single) infection and 31 of mixed infection out of 136 cases and remaining 19 cases are sterile.

Warrants and Jonen (1969) studied in 109 cases and they found 58 pure infection and 34 mixed infection and remaining 17 was found sterile.

Gutierrez E.H. (1972) studied the 551 cases of positive culture in which he found 403 (73.14%) cases of pure infection and 148 (26.18%) cases of mixed infection. He also observed that staphylococcus aureus was the dominating organism present in 282 (51.00%) cases and involvement of streptococcus pneumoniae was only in 43 (8.0%) cases. Others organism he found i.e. Strep. hemolyticus, strept. viridans, Klebsiella etc.

Seal D.V., Barrelet S.P. and Mc Gill J.I. (1980) observed the bacteriology of the patient of dacryocystitis. They studied bacterial growth in 31 patients eyes. They isolated the following pathogenic organism i.e. staphylococcus aureus, strept. pneumoniae and haemophilus influenzae were the main. Staphylococcus viridans was associated with conjunctivitis in patient aged under 1 year. Moraxella sp. was isolated on only one occasion.



Overall 40% of specimens were associated with staphylococcus epidermidis or mixed flora, which also occurred with culture of normal eye. Clostridium welchii was isolated on 3 occasions but was not associated with bullae or gas gangrene. The least overall resistance of 6% was to chloramphenicol, but no one antibiotic was effective against all pathogens. They found pure infection of staphylococcus pneumoniae 10% haemophilus infection 3% and coliform sp. 3% and strept. viridans 4% and remaining 16% one sterile (no growth).

Bale Rajeev N. (1987) studied in 100 cases and did culture of 143 eyes in which he found pure infection in 71 cases and mixed infection in 21 cases and rest of 57 cases were found sterile. In which he found 24% involvement of staphylococcus and 17.94% involvement of D. pneumoniae.

Tumours and neoplasm of nasolacrimal duct and lacrimal sac have also been discussed by many authors. Sexton (1970) recorded neoplasm of lacrimal sac which was epithelial in origin but others have also been described as of mesenchymal origin.

Seal et al (1981) studied the anaerobic bacterial growth examination of 27 eyes of dacryocystitis patient and found three are positive for *Clostridium perfringens* infection and all 27 cases of dacryocystitis had a similar flora of conjunctiva of the same.

Stanley J. cent (1963) observed that the heavy growth of *Staphylococcus aureus* and *pyogens* in the cases of dacryocystitis along with acute leukemia patient.

The gross pathology had been described by Rollet and Busy (1923), they described the changes in the anatomical picture of lacrimal sac. The sac is usually shrank but may be dilated and due the folds of goblet cells, it may be obliterated and leading to obstruction.

Bomer M.C. (1931), Firde deantal (1964), Rahi A.H. (1967) and casanovas (1969), Agarwal L.P. (1970) described that the pathologically the inflammation of lacrimal sac passes through three stages -

(1). The stage of infiltration and oedema (which may be considerable) leading to a blockage of canal.

(2). A stage of commencing fibrosis on accumulated exudate which can also be responsible for the blockage of the canal.

(3). Finally a stage of complete fibrosis. He observed that the -

"Obstruction of lower end of duct may be caused by the pressure of nasal polypi, hypertrophied inferior turbinate bone, extreme deviated nasal septum or by chronic rhinitis".

The pathology of chronic dacryocystitis is described by Rahi A.H. in 1967. He found that the size of the sac may vary from small sclerotic remnant to huge dilated structure eg. large diverticula. In dilated sac, the walls of the sac are frequently twice or thrice of the normal size. So the mucosa is roughened and goblet cells are increased in number. The walls and mucosal folds are thickened and exaggerated thus the lumen is completely obliterated. Sometimes one or more structure may appear favourably at the lower end of sac.

Granston (1938) observed that the lacking of complete canalization of canalicula is found to be responsible for the chronic dacryocystitis.

Pathological changes of trachomatous dacryocystitis is described by Gall and Brosen (1956) and Charmis J. (1957).

Gross nasal pathology described by the Planter also. It is known that inflammatory changes usually start and are more marked in the lower region reaches of the lacrimal passages and it is probable that in a large number of cases their incidence is determined by the direct spread of infection from the nose. It seems equally probable, however, that nasal disease is not the sole factor in the aetiology of dacryocystitis, but that it usually requires a favourable soil for its extension. It can not by itself, for example explain social and sex incidence of dacryocystitis in or can it be regarded as invariably present.

Von Szilly A. (1920) described the pathology of the lacrimal passage as seen by roculgenography.

Malik S.R.K. and others (1969) studied 169 cases of chronic dacryocystitis and they found shallow constriction at the junction of the sac and the duct and indicated the location of the value of krause. In 10.8% cases constriction in the calumn of contrast medium in naso - lacrimal duct seen. These were possibly due to mucosal



folds. In the other cases the valve were absent and the duct looked like a smooth tube. In two cases small single diverticule were seen in the lateral wall of the duct. In one case the duct was tortuous.

Complete obstruction was found in 80% of cases and incomplete in 8.8%. In 11.2% there was no obstruction observed by Nahata (1964).

The commonest site of obstruction was the junction of the lacrimal sac and the nasolacrimal duct 53.2% and the next commonest site was the sinus maier 24.3% of cases. Observed by Campbell (1964).

In female the luman of lacrimal passage is narrower than male so dacryocystitis common in female, described by Rault and Laren B. in 1932.

First case of conjunctival infection was noted by Kirkpatrick in India and in 1961 he published the first case of lacrimal sac involvement due to that.

Following nasal pathology are involved in dacryocystitis -

- Hypertrophy of Inferior Turbinate bone -  
inlargement of flattening of the inferior  
turbinate bone which may almost obliterate the

anterior part of the meatus and may cause a local rhinitis implicating the opening of the duct. It was observed by Post (1928), Veris (1955) and others.

- Extreme deviation of Nasal septum - extreme deflection of nasal septum may compress the inferior turbinate against the lateral wall of nose, so nasolacrimal duct of the same side to be compressed and dacryocystitis results as observed by Kefler (1930), Bockstein (1926) and others.
- Packing of Nose - Kofler (1930) observed that due to long term packing of nose cause suppurative dacryocystitis.
- Congestive and hypertrophic condition of mucosa whether vasomotor or inflammatory may similarly cause a varied degree of obstruction at the lower end of canal observed by Traquair (1941) and Rutz et al (1966).
- Inflammatory condition whether chronic nasal catarrh or the more acute and suppurative inflammation may spread into the lower part of the duct and dacryocystitis results as observed by Duke elder (1952).

- Atrophic condition in the nose, frequently figure in the etiology particularly ozoena, the destruction of the mucosa leaving a patulous ostium not only permitting ready extension of the disease upward but allowing the direct entrance of infective secretion into the duct on blowing the nose, observed by Franceschetti (1935), Heilmäier (1959). They observed 136 cases of Atrophic Rhinitis among 352 cases of dacryocystitis.
- Sinus disease has undoubtedly a close relation with lacrimal inflammation. Here again some advocates of this particular source of infection have undoubtedly over stressed their case.

Many authors claimed that sinusitis and dacryocystitis co existed in to large a proportion of cases to be coincidental and that the later frequently cleaned upon the relief of the nasal condition observed by the Peters (1913) 50% of case of suppurative dacryocystitis with fistula, Kuhut (1914) found 68% cases of dacryocystitis certain and 23% of probable sinus disease. Brunzlow (1920) found 63.5% and 22% Cardar (1934) 46% and 35% probable, Gertin (1942) 55% certain.

It is probable that infection of (nose) spreads either by venous or lymphatic pathways by continuity lacunae in the lacrimal bone. Some times allow direct continuity between the ethmoid and the sac, the wall of the lacrimal fossa and the upper part of the duct being pneumatized by ethmoid cells, or the lacrimal bone, which is paper thin, becoming observed by age, carrier or pressure, which the pericystic tissue rich in lymphocytes and heavily vascularised from a readily traversible bridge between the two.

Stoloff and Gill (1986) observed that a slow growing facultative anaerobic gram - ve bacilli *E. Corroden* is also pathogenically responsible for the dacryocystitis of the human being. They studied 33 cases of *Eikenella corroden* infection is general hospital and in which they found one case of dacryocystitis due to same infection. Dua H.S. and others in 1988 also observed the involvement of lacrimal passage by the same bacilli.



Bale R.N. (1987) studied in 100 patients and he found the various nasal pathology in all known cases of dacryocystitis.

-	Inferior tubrinate hypertrophy (ITH)	-	3 cases of unilateral and 3 cases of bilateral
-	Deviated nasal septum (DNS)	-	6 cases unilateral and one bilateral
-	Rhinitis	-	2 unilateral and 4 bilateral
-	DNS + ITH	-	2 case unilateral & 6 cases bilateral.

So in 100 patients the total involved eyes are 143 (by dacryocystitis) and out of them nasal pathology found in 41 eyes.



MATERIAL AND METHOD

## MATERIAL AND METHOD

---

### Study site :

The present research study which embarasses several fields of ophthalmology with or without nasal ailment was undertaken at the out patient department and wards of Ophthalmics, M.L.B. Medical College, Jhansi, which is surrounded by the extension of Vindhyachal Mountain. As a matter of fact this ecozone is mixed in its climatic conditions and the general standard of the population living in. Thereby provided an unique appportunity to undertake the present research problem, which was not been attempted in past by any one what so ever. The study site consist all relevant technical equipments, availability of patient and necessary library material in view of the running Medical College.

### Clinical Material :

The clinical material for bacteriological study and its relation with nasal pathology of disease dacryocystitis has been selected from the patients attending the eye out patient department and those admitted in the eye wards of M.L.B. Medical College Hospital, Jhansi between Oct., 1988 to June, 1989.

There were either diagnosed as cases of chronic dacryocystitis primarily or were cases of cataract, gloucoma, iriodocyclitis, corneal ulcer etc. and were found to having chronic dacryocystitis also on routine ocular examination and syringing.

Sample size :

In the present research study 50 subjects 62 eyes were choosen on the basis of chronic dacryocystitis diagnosed in the Ophthalmic O.P.D., M.L.B. Medical College, Jhansi. Thus, the significance of the selected sample becomes very much imperative and of great importance to the medical field as the analysis reveals most alarming facts selected with the said proposition i.e. 'Chronic dacryocystitis'. This would be worthwhile to mention have that rational standard of the data so collected in the present study is of utmost importance from the proper treatment and statistics point of view.

Criteria of patient selection :

The patients selected for the study had some complaints, pertaining to chronic dacryocystitis like -

- (1). Excessive watering from one or both eyes of various duration.

PHOTOGRAPH NO. 1



SHOWING A 36 YEARS OLD LADY,  
SUFFERING FROM CHR. DACRYOCYSTITIS  
WITH LAC. FISTULA (LEFT EYE)

- (2). Watering was accompanied with discharges -
- Serous
  - Mucoid
  - Mucopurulent
  - Purulent
- (3). Regurgitation of discharge on pressing over the sac - area with thumb.
- (4). Non inflammatory swelling present over the sac area for a long duration.
- (5). Any opening or fistula present in the sac area for a long duration, accompanied with watering or discharge from the opening.
- (6). Patient used to evacuate the discharge by pressing the sac with thumb.

Methods :

(1). History :

In the outdoor patient department as the patients complained of excessive watering associated with other complaints or alone, they were asked some relevant questions as follows :

- Duration of excessive watering
- Any associated discharge



- Any past history of a swelling over the sac area.
- Any association with redness of the eyes.
- If redness of the eye; then it was a constant feature of frequent attacks of redness.
- Any association of nasal complaints like - common cold, sneezing, pain in nose during blowing.
- Any association of nasal discharge.
- The redness of the eye is followed by watering or vice versa.
- Any history of chronic infections like - tuberculosis, leprosy, syphilis etc.

(2). Past and Family history :

The detailed enquiry was made about any previous complaints related to the disease like - recurrent swelling and redness over the sac area with watering from the same sided eye. Also asked the patient about the same type of complaints for their family members and which type of treatment they had.

(3). Socio - economic status :

Whether patients belongs to poor, middle (average) or high socio - economic status. The patients, whose income per capita was less than Rs. 140/- per month were of poor status, Rs. 140 - 599/- per month were of average and more than Rs. 600/- per month were of high socio - economic status, as described by Srivastava (1982). The hygienic condition of surroundings also had been asked. Personal hygienic condition of the patient and cleanliness is also observed.

(4). Local examination :

After the detailed history, the local examination was done, as follows :

(a). External ocular examination :

The complete external ocular examination is done to exclude any abnormality of lid, conjunctival sac, conjunctiva proper, cornea or any swelling around the eye specially near the medial canthus.

(b). Regurgitation test :

To test the regurgitation in the left eye the head of the patient is fixed with the right hand and the thumb of the left hand is kept on the sac area of left eye, keeping the lower lid slightly everted to sac the lower puncta clearly. Now pressure is applied by the left thumb to press the sac area and to observe any regurgitation of fluid from the lower punctum. It was also noted whether the discharge is watery, mucoid, mucopurulent or purulent. The right eye is also examined similarly.

(c). Fluorescein dye test :

The patient is asked to lie down on the examination table and two drops of 2% fresh fluorescein are instilled in the conjunctival sac of the eye which is to be examined. Insert a sterilised cotton swab dipped in 2% xylocain at the level of inferior meatus of nose on the same side, which is just under inferior turbinate

bone about six mm behind its anterior attached border. Now the patient is asked to blow the nose, if the cotton swab is stained, the lacrimal passage is patent and if not, there is an obstruction on that side. In some cases like - dilated atonic sac or partial stricture the coloured fluid did reach the interior meatus of the nose. The same technique is applied to test the other side.

(d). Schirmer's test :

Equipments :

- Xylocain 4%
- Filter paper strip 35 mm x 5 mm

Ask the patient to lie down on the examination table and 4% xylocain drops put in the eye to be tested. Wait for one minute and wipe off the extra amount of xylocain from the conjunctival sac with a wet cotton swab, the light should be subdued.

The filter paper strip is folded at 5 mm distance from one end and this end is kept in lower fornix, rest of the filter paper strip is allowed



to hang over the lower lid. After waiting for 5 minutes, the extent of wetting of filter paper is observed. 15m.m. wetting of paper is considered to be normal and above it is considered a case of epiphora.

(e). Syringing of lacrimal sac.equipments :

- Xylocain 4%
- Sterlised syringe 2/5 ml.
- Punctum dilator
- Normal saline
- Lacrimal cannula
- Normal saline or sterile penicillin solution.
- Antibiotic eye drops or ointment.

The patient is asked to lie down on the examination table and 4% xylocain drops is instilled in the eye to be tested. Asked the patient to close the eye for two minutes, now the lower lid is everted with the left hand, the Nettleship's punctum dilator is held in the right hand and inserted gently but firmly into the lower punctum with slightly rolling it like a screw, it inserted first directly downwards by 1 - 2 m.m. then horizontally and medially towards the lacrimal

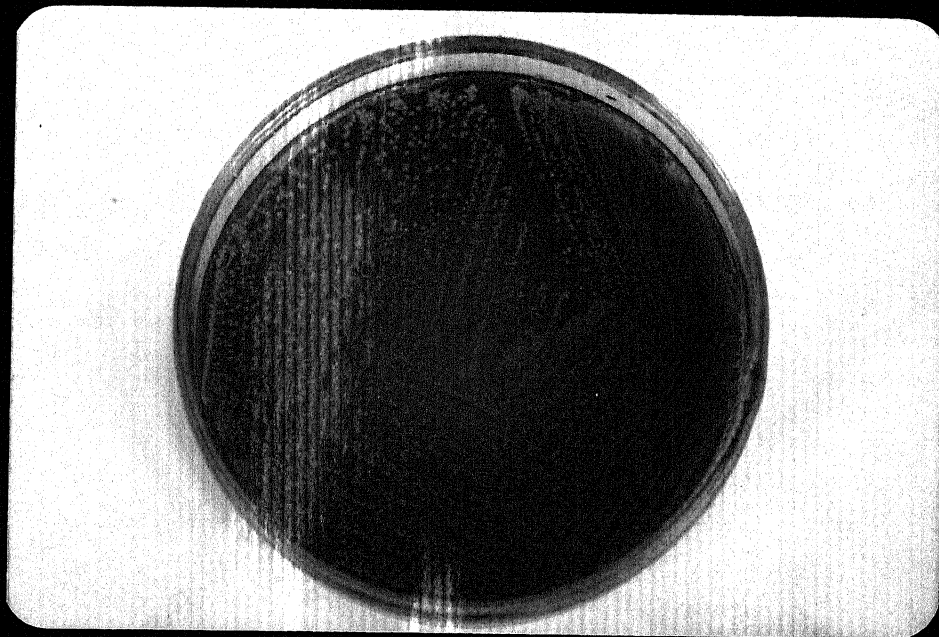


sac. The dilator is then rotated 3 - 4 times so as to dilate the punctum. Now the 2 cc / 5 cc syringe is filled with normal saline or pencilline solution, a lacrimal cannula is attached to it. This is inserted in to the dilated punctum in the same direction and the fluid is pushed in the lacrimal sac. It is noted if the fluid is going normally or gentle pressure is required, or if regurgitation of fluid is present, it is to be observed carefully whether the regurgitating is through upper or lower puncta and also the colour and consistency of fluid.

If the fluid reached normally down the nasolacrimal duct to the nose and finally to the nasopharynx, the patient feels bitter or salty taste in his / her mouth, meaning thereby that the sac is patent, absence of bitter or salty taste in the mouth means an obstruction and the regurgitation of fluid is present through the same or opposite puncta.

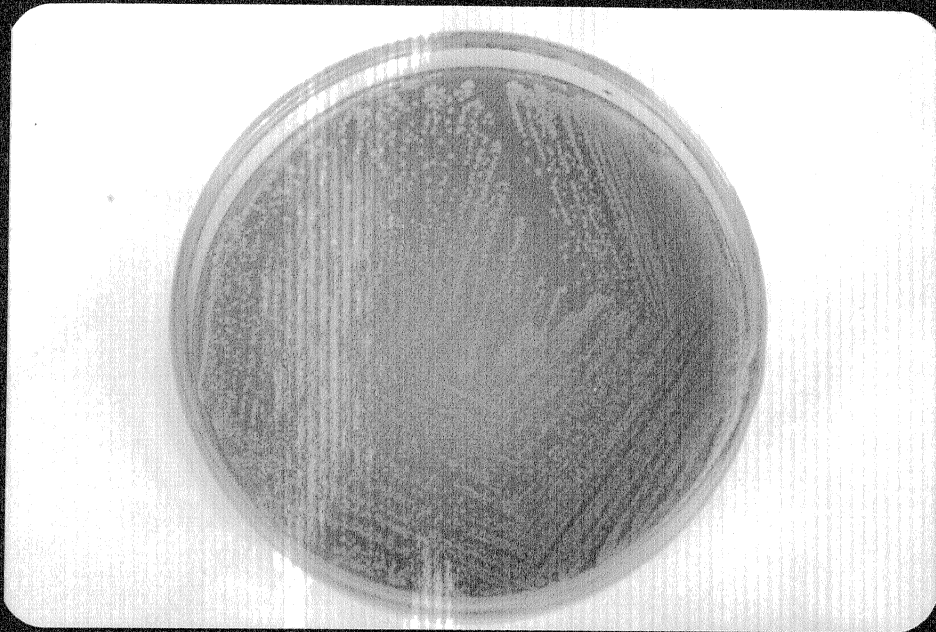
After the test antibiotic eye drops or ointment is put in the eye.

PHOTOGRAPH NO. 2



GROWTH OF STAPHYLOCOCCUS ON BLOOD  
AGAR PLATE, SHOWING BETA HAEMOLYSIS  
AROUND THE COLONIES

PHOTOGRAPH NO. 2



GROWTH OF STAPHYLOCOCCUS ON BLOOD  
AGAR PLATE, SHOWING BETA HAEMOLYSIS  
AROUND THE COLONIES

Conclusion :

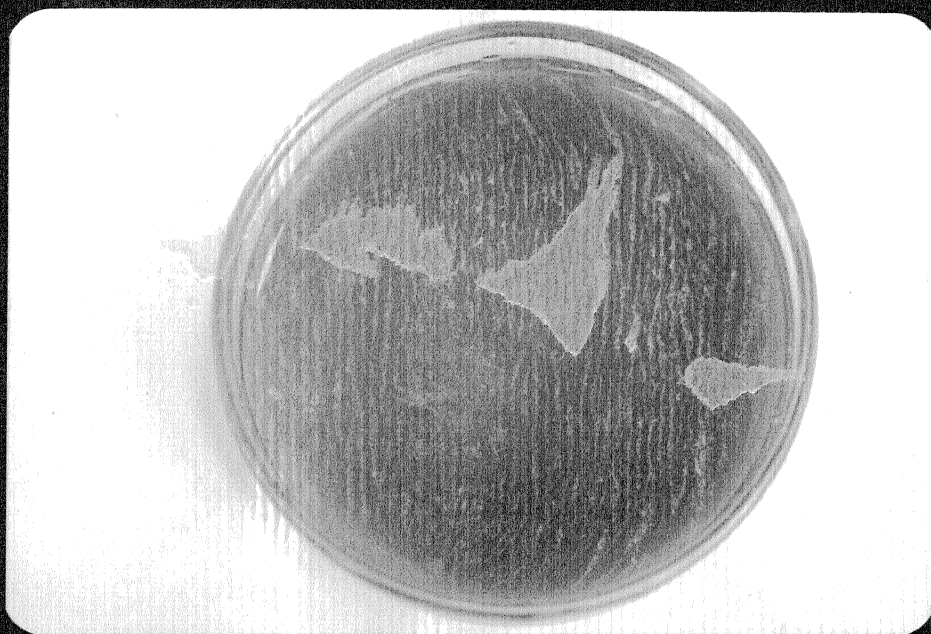
- If regurgitation through same punctum the obstruction is in the lower canaliculus.
- If regurgitation through (opposite) upper punctum - the obstruction is in the nasolacrimal duct or lower end of the sac.
- If considerable pressure is required for syringing may be a stricture in the sac area.
- If the fluid reached the mouth normally - no obstruction.
- If syringing is not possible through the lower punctum due to stricture or congenitally absent the syringing is done from the upper punctum, and during the process the conjunctival sac is kept dry so that the slightest regurgitation of the fluid is marked out easily.

(f). Examination of nose and paranasal sinuse :

It is performed with the help of E.N.T. Surgeon in Out Patient Department of E.N.T., as follows -



PHOTOGRAPH NO. 3



GROWTH OF STREPTOCOCCUS ON BLOOD  
AGAR PLATE, SHOWING ALPHA HAEMOLYSIS  
AROUND THE COLONIES



Cases in this study were subjected to clinopath - radiological examination for nasal and paranasal sinus disease.

Facial examination was done to rule out any facial asymmetry due to chronic nasal obstructive pathology like - adenoids and severe septal deviation.

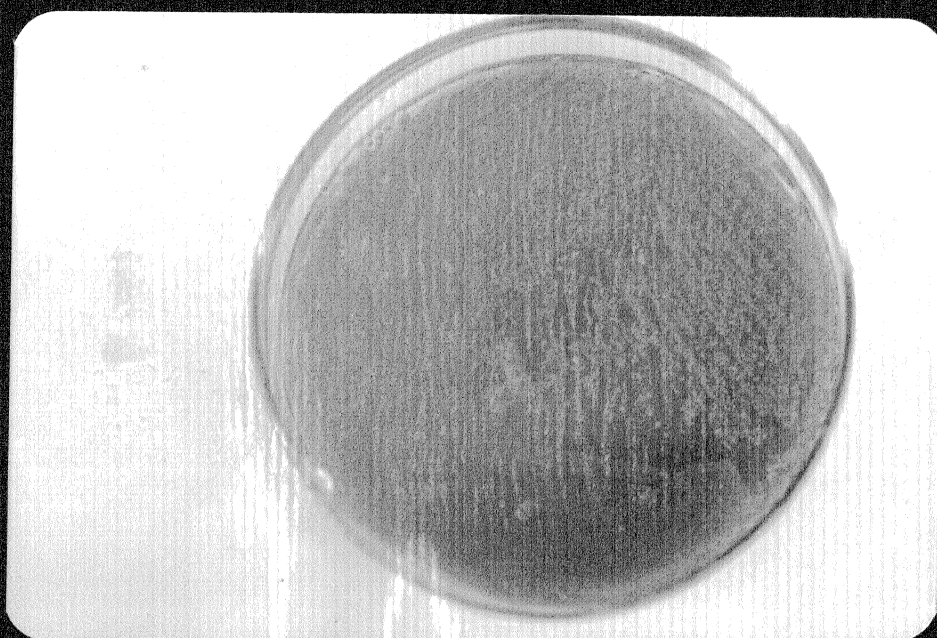
Anterior rhinoscopy was done to examine the acute and chronic nasal and paranasal infections and obstructive pathology.

Posterior rhinoscopy was done to rule out any infective and obstructive disease of nasopharynx, post nasal cavity and posterior group of sinuses.

Collection of specimens for culture :

From conjunctival sac - The patient was asked to lie down on examination table. Under dim illumination the lower lid was everted and a sterile cotton swab was rolled over the conjunctival sac to collect the discharge. The swab was placed in a sterile tube and the tube was labelled properly.

PHOTOGRAPH NO. 4



MIXED GROWTH ON BLOOD AGAR PLATE  
ONE TYPE IS HAEMOLYTIC, AND ANOTHER  
IS NON HAEMOLYTIC

From lacrimal sac - With the patient lying down, the area of the lacrimal sac was pressed with left hand. As soon as the discharge came out through puncta, it was collected on a sterile cotton swab, which was replaced in the tube and the tube was properly labelled.

Nasal discharge - A sterile swab was introduced into the nasal cavity upto the inferior turbinate. The swab was rotated and then withdrawn. It was placed in the sterile tube and labelled properly.

In bilateral cases the same procedure was adopted on other side also.

All the specimens were sent to microbiology laboratory as early as possible after collection.

Culture - All the swabs were inoculated on to blood agar and Mac Condey's agar. The plates were incubated at 37°C overnight and were examined nex day. Smears were prepared from all the colong types the growth was identified following standard methods, (Cruickshank et al (1975)).



OBSERVATION

# OBSERVATIONS

This study was conducted on the patients attending Ophthalmology department of M.L.B. Medical College Hospital, Jhansi for their ocular complaints during October, 1988 to June, 1989. A series of 50 patients of either sex and of any age were selected.

The study comprised of different type of dacryocystitis, which were grouped under following three catagories -

- I - Chronic dacryocystitis
- II - Chronic dacryocystitis with lacrimal fistula
- III - Mucocele.

TABLE NO. 1

( Different types of chronic dacryocystitis )

Group	Type	Cases	Percentage
I	Chronic dacryocystitis	46	92
II	Chronic dacryocystitis with lacrimal fistula	03	6
III	Mucocele	01	2
Total		50	100



As shown in table no. 1, out of the total 50 cases, the number of cases of chronic dacryocystitis were the maximum being 46 i.e. 92%, those with lacrimal fistula being 3 i.e. 6% and mucocoele 1 i.e. 2% .

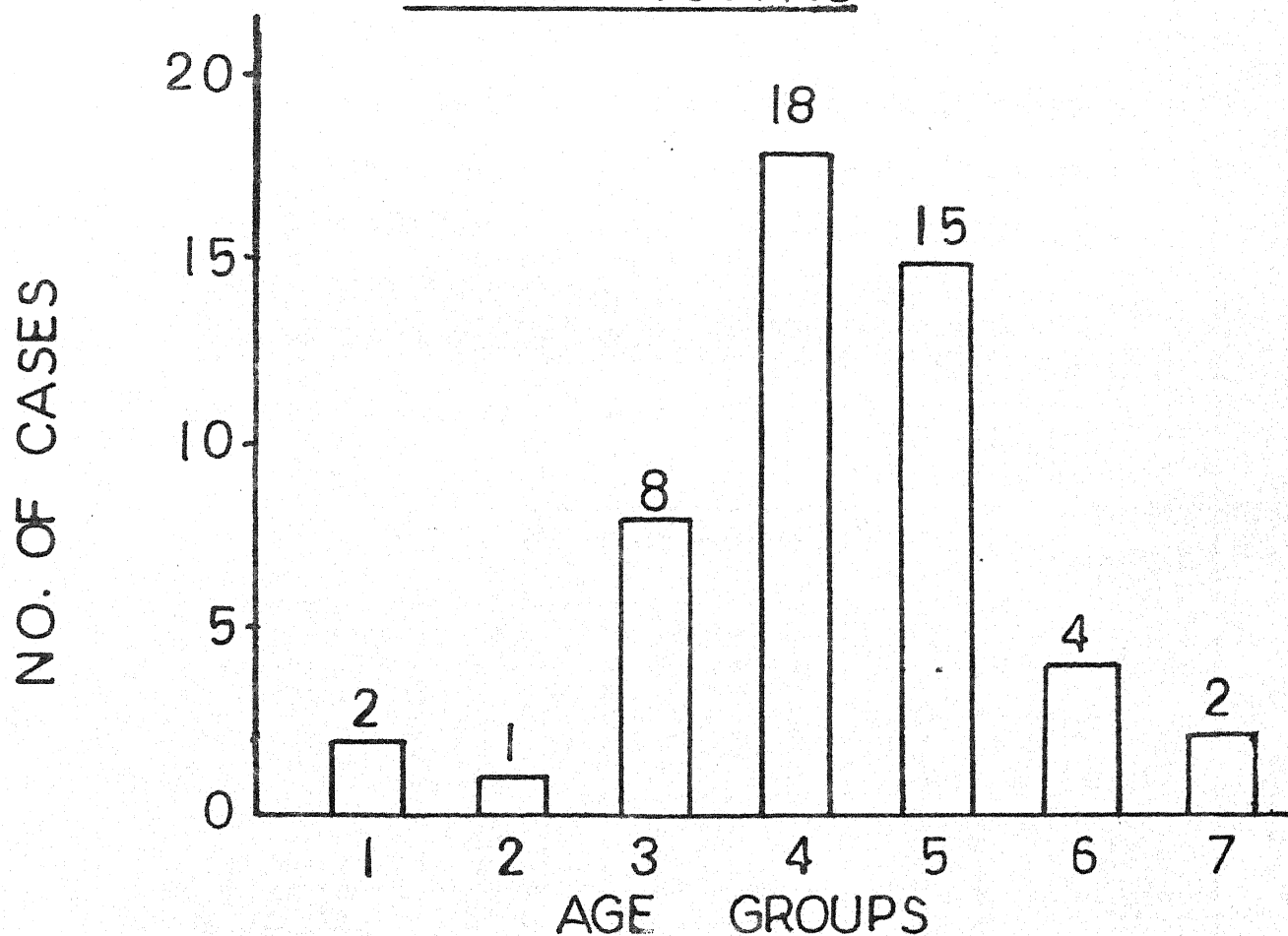
TABLE NO. 2  
( Age incidence )

Sl.No.	Age in years	Cases	Percentage
1.	0 - 10	02	4.0
2.	11 - 20	01	2.0
3.	21 - 30	08	16.0
4.	31 - 40	18	36.0
5.	41 - 50	15	30.0
6.	51 - 60	04	8.0
7.	61 - above	02	4.0
Total		50	100.0

As seen in table no. 2, the maximum incidence of the disease has been in the 4th and 5th decade of the life, being 18 cases - 36.0% in the 4th and 15 cases i.e. 30.0% in the 5th decade. Total 33 cases i.e. 66% have been noted between 31 - 50 years age group.

# INCIDENCE OF AGE IN 50 CASES OF CHR.

## DACRYOCYSTITIS



- |              |         |
|--------------|---------|
| <div>1</div> | 0 - 10  |
| <div>2</div> | 11 - 20 |
| <div>3</div> | 21 - 30 |
| <div>4</div> | 31 - 40 |
| <div>5</div> | 41 - 50 |
| <div>6</div> | 51 - 60 |
| <div>7</div> | 61 - >  |

The incidence is the least in early childhood 0 - 20 years and above 60 years of age, there being only 3 cases i.e. 6.0% and 2 cases i.e. 4.0% respectively. Only 8 cases i.e. 16.0% observed between the age of 21 - 30 years and 4 i.e. 8.0% cases observed between the age of 51 - 60 years.

TABLE NO. 3  
( Sex incidence )

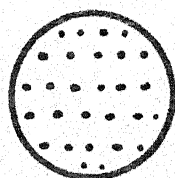
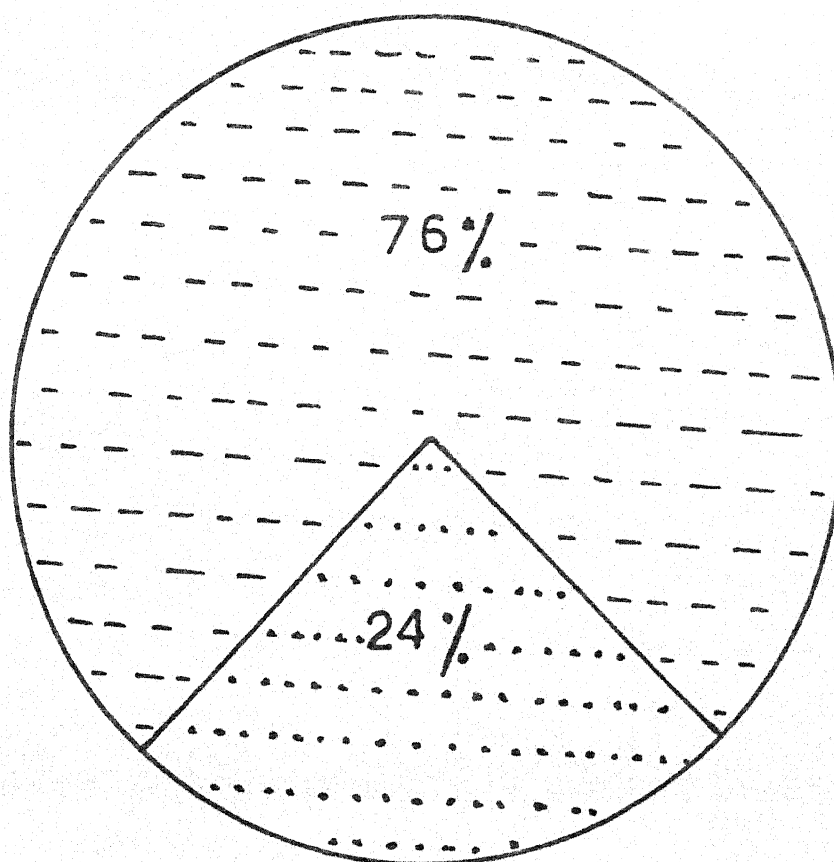
S.No.	Type	Male	Percentage	Female	Percentage
1.	I	12	24.0	34	68.0
2.	II	Nil	Nil	03	06.0
3.	III	Nil	Nil	01	02.0
Total	50	12	24.0	38	76.0

The incidence of affected females is more than the males being three times, i.e. 76.0% females and 24.0% males vide table no. 3.

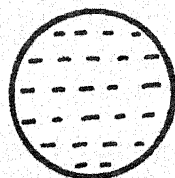
In the present series the number of cases of chronic dacryocystitis (group - I) were more in the females being 68.0% and in males being 24.0% . Whereas cases with fistula and mucocoele (group II & III) have been encountered only in females and none in the males.

INCIDENCE OF SEX IN 50 CASES OF CHR.

DACRYOCYSTITIS



MALE



FEMALE



TABLE NO. 4  
( Socio - economic status )

S.No.	Status	Cases	Percentage
1.	Poor	29	58.0
2.	Average	18	36.0
3.	High	03	06.0
Total		50	100.0

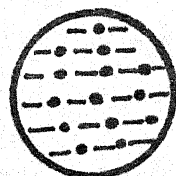
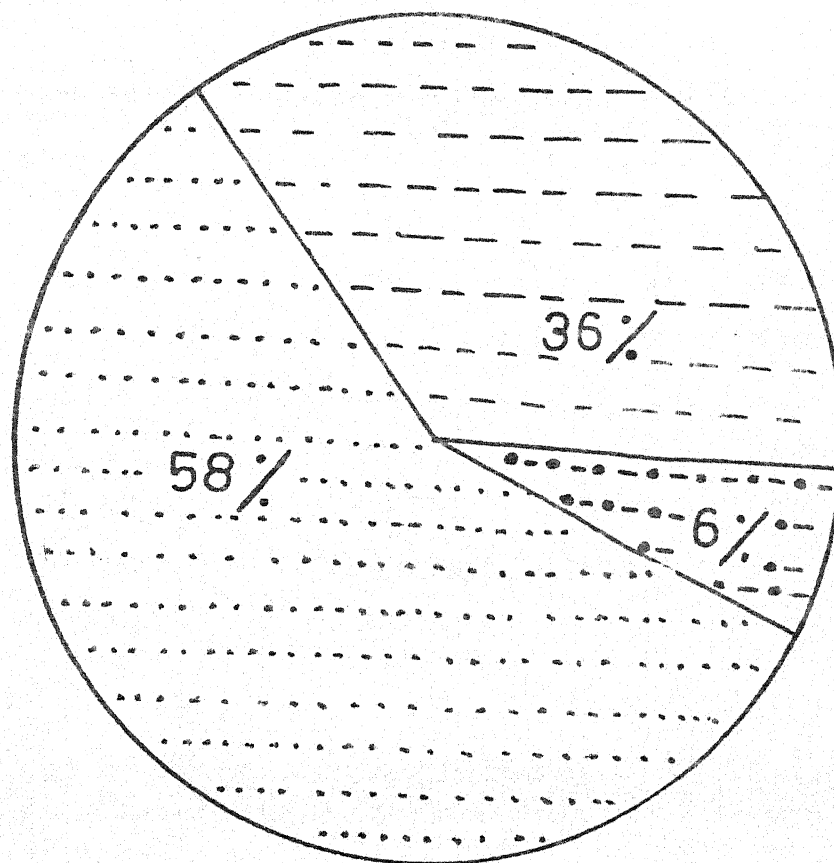
As shown in table no. 4, the patients, which are from poor socio-economic status, were affected maximum i.e. 58% while the high socio-economic patients affected least i.e. 6.0%. The patients of average status affected were 36.0%.

The socio-economic status of the affected patients has been classified to the income per capita per month. The poor with an income per capita per month of less than Rs.140/-, average between Rs. 140 - 599/- and the high status those having more than Rs. 500/-.

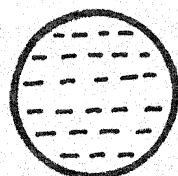


# INCIDENCE OF SOCIAL STATUS OF 50

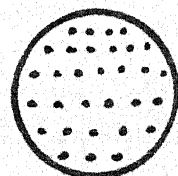
## CASES OF CHR DACRYOCYSTITIS



HIGH



AVERAGE



POOR

TABLE NO. 5  
( Eye affected )

Sl.No.	Type	Rt.Eye	%	Lt.Eye	%
1.	I	26	41.94	32	51.61
2.	II	Nil	Nil	03	04.84
3.	III	Nil	Nil	01	01.61
Total		26	41.94	36	58.06

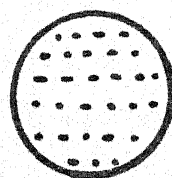
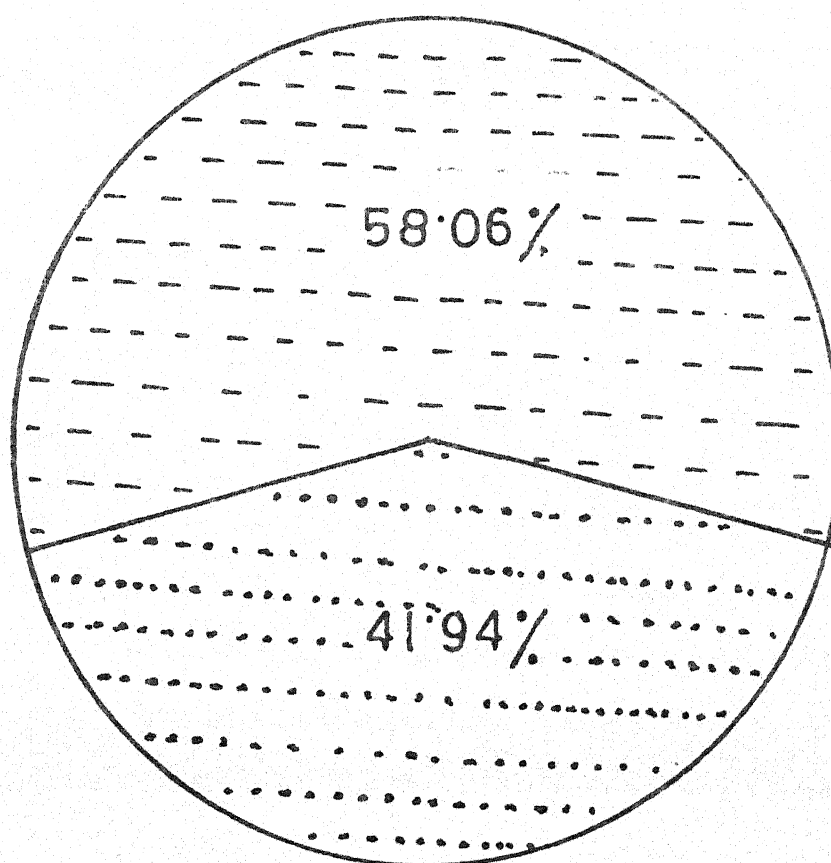
There is an overall preponderance of the left eye affection by 58.06% as compared to the right eye by 41.94% .

In cases of chronic dacryocystitis ( group-I) left eye affection is 51.61% where as right eye is only 41.94%. In cases of chronic dacryocystitis with fistula and mucocele (group II & III) only left eye affection has been observed, being 4.84% and 1.61% respectively.

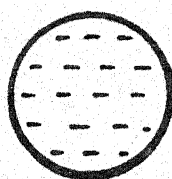
Out of 50 cases of dacryocystitis 38 (76%) cases were affected unilaterally and remaining 12 (24%) cases were affected bilaterally.

INCIDENCE OF SIDE AFFECTED IN 62 EYES

OF CHR. DACRYOCYSTITIS



Rt EYE



Lt EYE

TABLE NO. 6

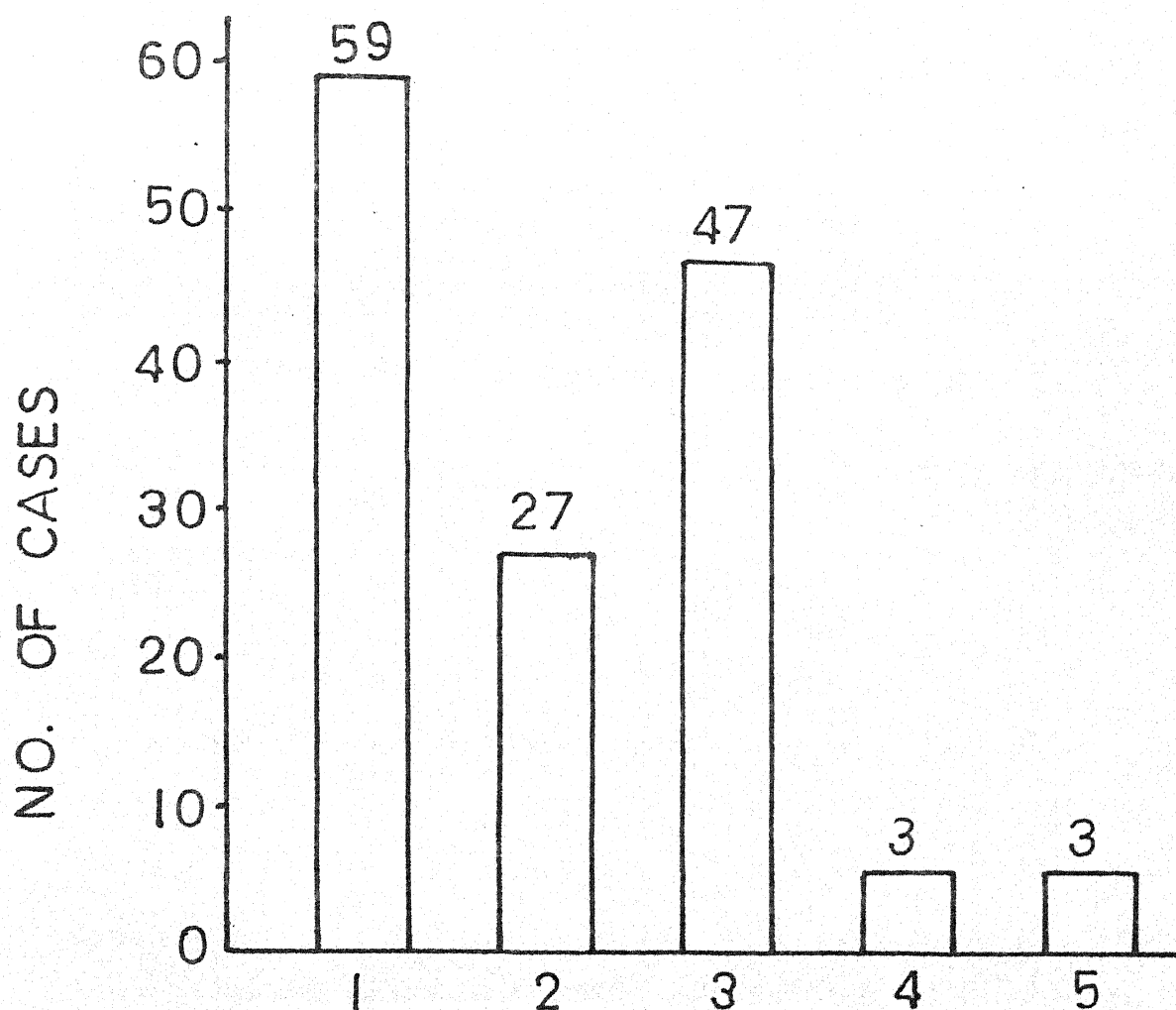
( Signs and symptoms of types of disease )

Sl. No.	Signs & symptoms	Group-I		Group-II		Group-III		Total	
		Eyes	%	Eyes	%	Eyes	%	Eyes	%
1.	Epiphora	56	90.32	2	3.22	1	1.61	59	95.16
2.	Discharge	26	41.96	1	1.61	0	-	27	43.56
3.	Regurgitation on pressure	46	74.19	-	-	1	1.61	47	75.80
4.	Swelling over sac area	-	-	2	3.22	1	1.61	03	04.84
5.	Opening in sac area	-	-	3	4.84	-	-	03	04.84

As shown in table no. 6, the maximum incidence is of epiphora i.e. 95.16%, discharge being present only in 43.56% eyes. The commonest sign is regurgitation pressure found in 75.8% eyes. In the present series swelling and opening in the sac area being only 4.84% and 4.84% eyes respectively. It can also be noted that epiphora is present in 90.32% eyes of chronic dacryocystitis (group-I) and only 75% eyes of mucocoele and chronic dacryocystitis with fistula (group-II & III). Whereas regurgitation on pressure was present in all eyes of mucocoele and 74.19% eyes of chronic dacryocystitis (group II & I).



INCIDENCE OF SYMPTOMS & SIGNS IN 62  
EYES OF CHR. DACRYOCYSTITIS



SYMPTOMS AND SIGNS

- ☐ 1 EPIPHORA
- ☐ 2 DISCHARGE WITH EPI.
- ☐ 3 REGURGITATION WITH EPI.
- ☐ 4 SWELLING WITH EPI.
- ☐ 5 OPENING

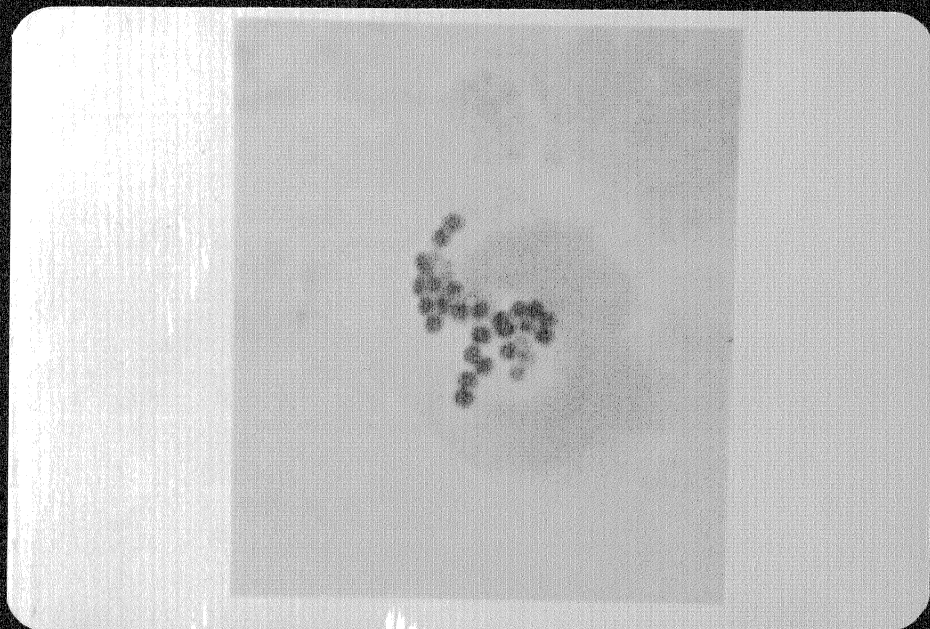


TABLE NO. 7

( Showing the details of culture report of all the samples )

Name of the Organism	Conjunctival sac		Lacrimal sac		Nasal mucosa		Total	
	No.	%	No.	%	No.	%	No.	%
Staphylococcus epidermis	12	19.35	10	16.12	16	25.80	38	20.43
Staphylococcus aureus	4	6.45	2	3.22	4	6.45	10	5.37
Streptococcus viridans	4	6.45	7	11.29	2	3.22	13	6.98
Streptococcus pyogenes	0	-	8	12.9	5	8.06	13	6.98
D.pneumoniae	4	6.45	5	8.06	6	3.67	15	8.06
Micrococcus	2	3.22	2	3.22	4	6.45	8	4.30
E. Coli	1	1.61	1	1.61	0	-	2	1.07
Klebsiella	1	1.61	0	-	2	3.22	3	1.61
Streptococcus beta Hemolytic	0	-	0	-	2	3.22	2	1.07
Corynebacterium Diphtheriae	0	-	0	-	3	4.83	3	1.61
Pseudomonas	0	-	1	1.61	1	1.61	2	1.07
Mixed	6	9.67	6	9.67	5	8.06	17	9.13
Sterile	28	45.16	20	32.05	12	19.35	60	32.25
Total	62	100.00	62	100.00	62	100.00	186	100.00

PHOTOGRAPH NO. 5



GRAM STAIN OF LACRIMAL  
DISCHARGE : SHOWING  
STAPHYLOCOCCUS IN CLUSTERS

Out of fifty cases total number of affected eyes were 62. So 186 culture were done in which 62 culture each from conjunctival sac, lacrimal sac and nasal mucosa. In all 186 cultures, 126 cultures were positive and 60 culture reports were sterile. The details of organisms cultured from all the three sites are shown in above table no. 7. It is hereby studied that maximum infection is due to staph. epidermis, total 38 (20.45%) out of 186 cultures in which 12 from conjunctival sac, 12 from lacrimal sac and 16 from nasal mucosa.

The organism pseudomonas, diphtheriae, E.Coli, Beta hemolytic streptococcus and Klebsilla were found causing least infections i.e. 1.61 - 1.07% .

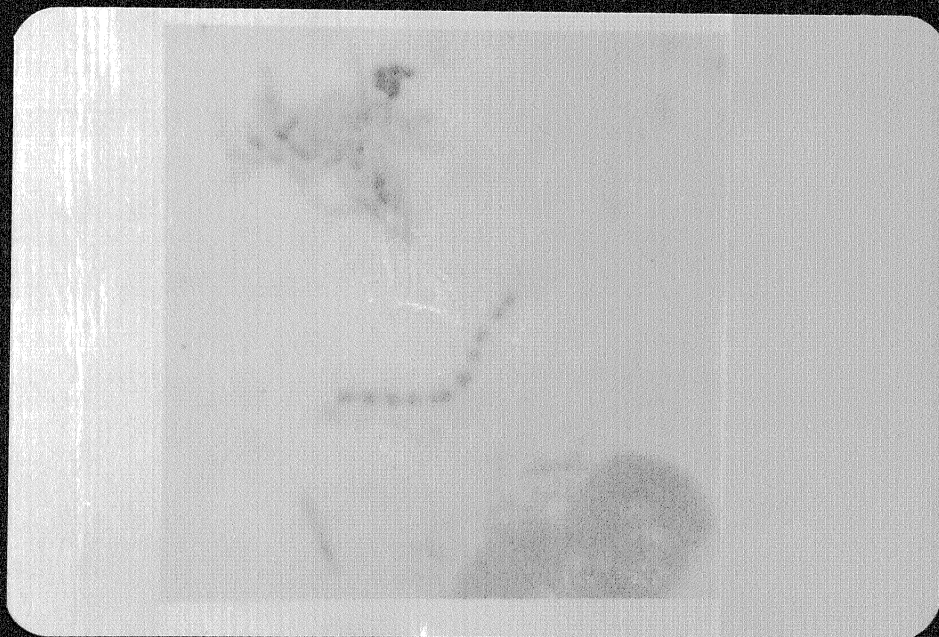
Organisms, found in the flora of D.pneumoniae in 15 culture plates - 8.06% .

Strept. viridans and St. pyogenes were found in 15 culture plates each i.e. 6.98% .

St.aureus found in 10 culture plates i.e. 5.37% .



PHOTOGRAPH NO. 6



GRAM STAIN OF LACRIMAL SAC  
DISCHARGE : SHOWING  
STREPTOCOCCI IN CHAIN

TABLE NO. 8

( Showing the organism grown in mixed cultures )

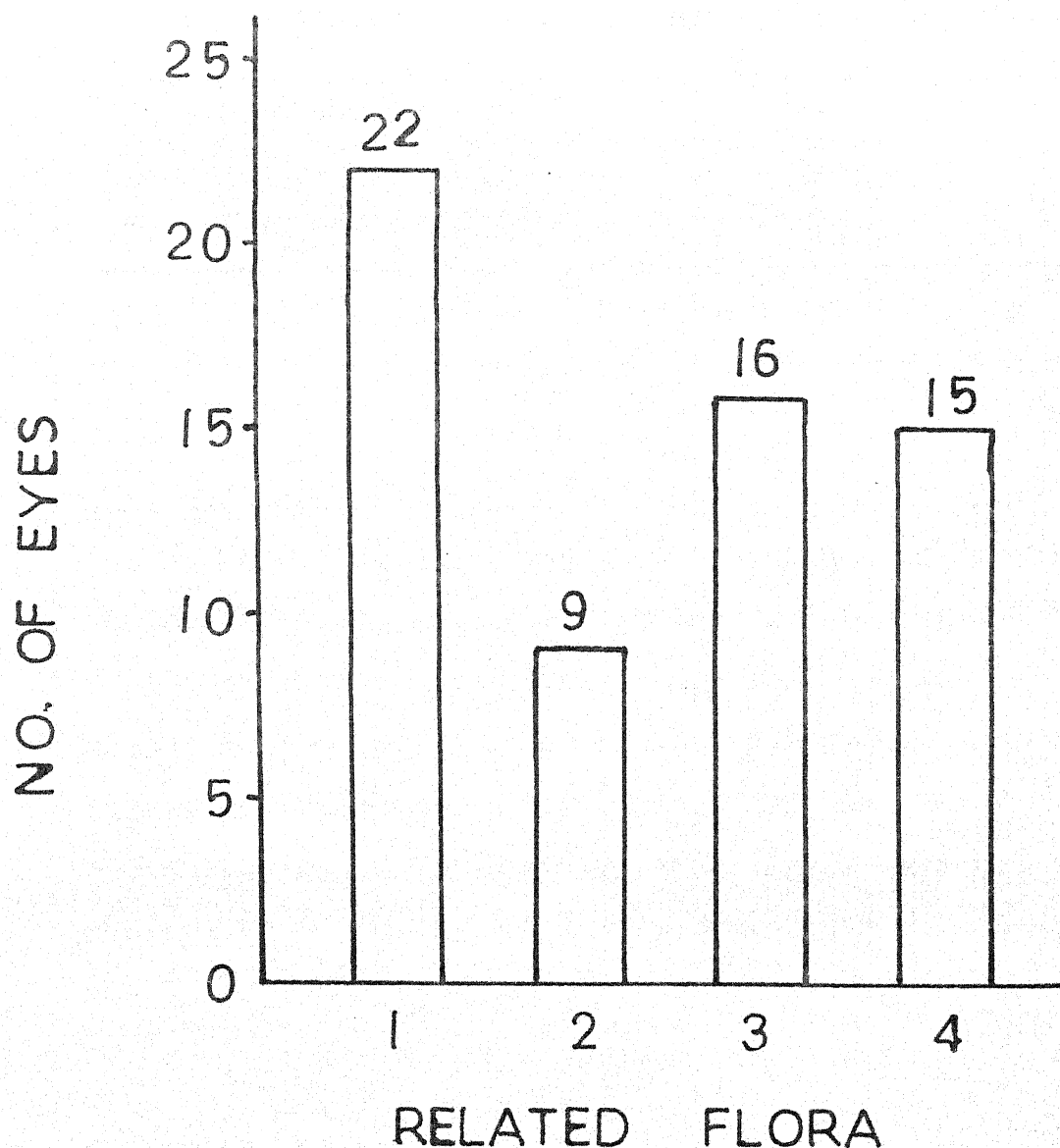
Name of Organism	Conjunctival sac no. of cases	No. of cases from Lacri- mal sac	No. of cases from nasal mucosa
Staph. epidermis St. viridans	2	2	1
Staph. aureus D. pneumoniae	1	1	1
Staph. epidermis B. Hemolytic Strept.	1	1	0
D. pneumoniae Micrococcus	1	1	1
Pseudomonas E. Coli	1	0	0
Cor. diphtheriae Micrococens	0	1	0
Staph. epidermis St. pyogenes	0	0	1
Staph epidermis Klebsiella	0	0	1
<b>Total</b>	<b>6</b>	<b>6</b>	<b>5</b>



The mixed culture have been also found in all three sites. So these were also studied in detail. The mixed flora of staph. epidermis and st. viridans was found maximum 5 out of 17 in which 2 being of conjunctival sac , 2 lacrimal sac and one from the nasal mucosa. Mixed flora of Staph. aureus and D. pneumoniae were found 3 in which one from each side and also the same in case of mixed flora of D. pneumoniae and micrococcus. St. epidermis and B. hemolytic streptococcus mixed flora were found two, in which one from conjunctival sac and one from lacrimal sac and none from nasal mucosa. Rest of all four types of mixed flora were found, one of each type mixed flora of pseudomonas and E. Coli was found only in conjunctival sac and the mixed flora of staph. aureus and micrococcus was found only from lacrimal sac and mixed flora of St. epidermis and st. pyogenes and flora of st. epidermis+ Klebsiella was found only in nasal mucosa.

# RELATIONSHIP BETWEEN THREE FLORA IN

## 62 EYES OF CHR. DACRYOCYSTITIS



- ☐ 1 L AC. & CONJ. SAC
- ☐ 2 LAC. SAC & NASAL MUC.
- ☐ 3 ALL THREE SAME
- ☐ 4 ALL THREE DIFFERENT

TABLE NO. 9

( showing the relationship between flora in the conjunctival sac lacrimal sac and nasal mucosa )

Side	Conjunctival sac and lacrimal sac (A)	Lacrimal sac and nasal mucosa (B)	All three same (C)	All three diff. (D)	Total (A+B+C+D)
Total	22	09	16	15	62
	(A + C ) 38		(B + C ) 24		

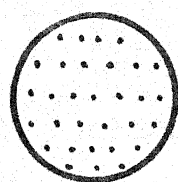
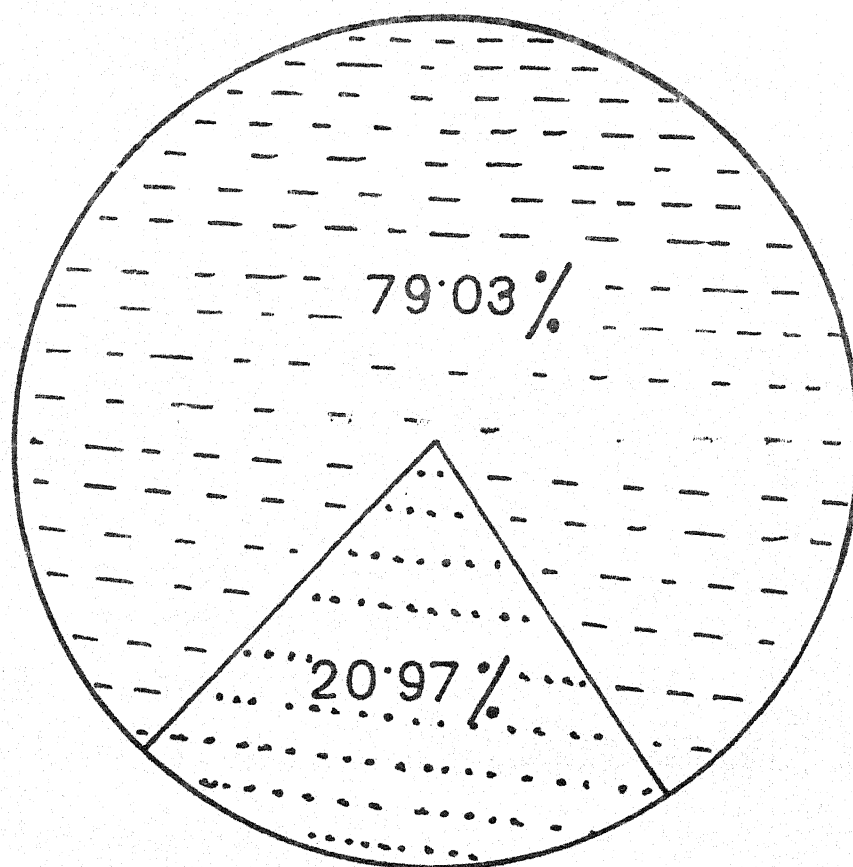
Shown the relationship of lacrimal sac between conjunctival sac and nasal mucosa. In which we found that 22 floras of conjunctival sac and lacrimal sac were same and only 9 flora of lacrimal sac and nasal mucosa are found same. All three flora are same found in 16 eyes and in 15 eyes all three flora were found different.

TABLE NO. 10

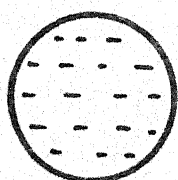
( Showing nasal obstructive / infective pathology and dacryocystitis )

Case type	Number of patient		Total no. of cases	Total no. of eyes
	Unilateral	Bilateral		
Nasal pathology present	9	2	11	13
No. Nasal Pathology	29	10	39	49
Total	38	12	50	62

INCIDENCE OF NASAL PATHOLOGY IN 62 EYES  
OF CHR DACRYOCYSTITIS



NASAL PATH. PRESENT



NO. NASAL PATH.



Out of 50 cases in present study 11 were having nasal pathology accounting for a total number of 13 eyes out of 62 eyes. The relationship between nasal obstruction or infective pathology and dacryocystitis is given in table no. 10. So 20.96% eyes of dacryocystitis were having nasal pathology.

TABLE NO. 11

( Showing various nasal pathology )

	DNS *	ITH **	RHINITIS	DNS+ITH	CASES	EYES
Unilateral	2	3	2	2	9	9
Bilateral	1	1	0	0	2	4

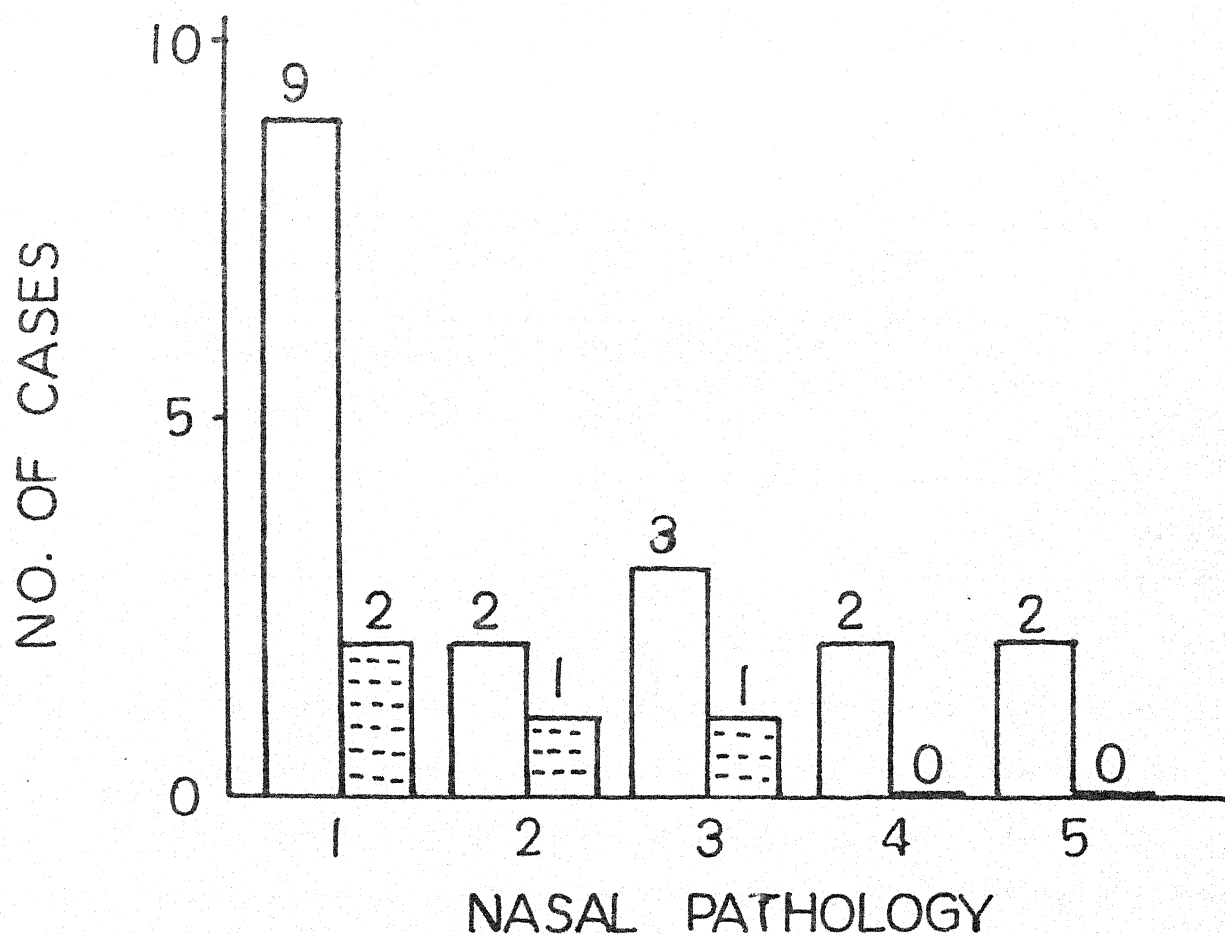
\* Deviated nasal septum

\*\* Inferior turbinate hypertrophy

Out of 11 cases of nasal pathology 9 are unilateral and two are bilateral. Table no. 11 shows, the detail of nasal pathology in which deviated nasal septum were found in 2 cases of unilateral and one case of bilateral and the inferior turbinate hypertrophy found, unilaterally in 3 cases and bilaterally 1 case. Involvement for rhinitis was found only in two eyes DNS + ITH, were found in two eyes only.

# INCIDENCE OF VARIOUS NASAL PATHOLOGY IN

## 62 EYES OF CHR. DACRYOCYSTITIS



[1] TOTAL CASES

[2] D.N.S.

[3] I.T.H.

[4] RHINITIS

[5] D.N.S. + I.T.H.

[ ] UNILATERAL

[ ] BILATERAL

TABLE NO. 12

( Relation between lacrimal sac and nasal flora  
in patient with nasal pathology )

Different flora of lacrimal sac and nose	Same flora of lacrimal sac & nose	Total
07	06	13

The relationship between lacrimal sac and nasal mucosa in the patient dacryocystitis with nasal pathology, shown in table no. 12 out of 13 cases with nasal pathology we observed that the flora of lacrimal sac and nasal mucosa was common in 6 eyes, where as it was different in 7 eyes.

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DISCUSSION



## DISCUSSION

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The relationship between bacteriology of dacryocystitis and nasal pathology have been studied by many persons, but yet not fully understood.

### VARIETIES -

Considering the various types of dacryocystitis the incidence of chronic dacryocystitis is most common as against the chronic lacrimal fistula and mucocele (Duke Elder 1952). However, in present series out of 50 cases studied, 46 cases (92%) were found to be of chronic dacryocystitis and rest 4 cases (8%) were of chronic lacrimal fistula and mucocele.

### AGE INCIDENCE -

As for as age is concerned the maximum incidence had been found in 4th & 5th decade of life. This was minimum in 1st, 2nd and above 6th decade. Traquair (1941) observed the maximum age incidence in the 5th and 6th decade. While almost similar observations were found by Duke Elder (1952), Reddy and Reddy (1955), Chatterjee (1955) and Agarwal (1961). Bale R. (1987) observed that commencement of disease at 30 years and maximum incidence in the 5th decade of life.

The probable cause of the occurrence of the disease in elderly persons may be emotional factors causing excessive lacrimation and relative insufficiency of drainage passages. The process starts at younger age, but patient starts complaining about the disease when the symptoms are precipitated at middle age.

SEX INCIDENCE -

Sex incidence bears an important role in the aetiology of the disease. The ratio is definitely high in females. In the present series the male - female ratio is found to be 24 : 76, that is in agreement with the others observations i.e. Traquair (1941) 17 : 83; Summer Skill W.H. (1949) 27 : 73; Duke Elder (1952) 20 : 80; Chatterjee (1955) 21 : 79; Reddy and Reddy (1955) 30 : 70; Malik et al (1969) 18.3 : 81.7. They stated that the females are almost three times more affected than the males. Sood et al (1967) and Bale Rajeev N. (1987) shows the male female ratio 37.7 : 62.3 and 43 : 57 respectively.

Various genuine reasons have been put forwards to explain the preponderance of the disease in the females like excessive lacrimation, less heartily blowing of the nose, uses of cosmetics and narrowness of the nasolacrimal canal as observed by Onode (1913), Ferandez (1921), Meller (1929), Baratta (1935) and Degliesh (1964). They described the high nasal index be the cause of frequency in females.

In India one more reason may be responsible for high incidence of disease in females, their long stay in kitchen where the dust and smoke (along with oil) may lead to lacrimation, stagnation of tears and infections. But this factor does not explain its high incidence in the western countries, where disease equally common in females as in our country. Women are more prone to disease because they keep more often than men might be the cause but it is hardly impressive ( Duke Elder - 1952).

#### SOCIO - ECONOMIC FACTOR -

As far as socio - economic factor counts in our study the poor class is affected maximum (58%) while average class affection is in 36% and high class affection is 6%. These findings were similar to those observed by Chatterjee (1955) and Reddy et al (1955), who observed maximum affection (70%) in poor patients, probably due to unhygienic surroundings. While Rosley S. and John (1967) reported 75% in poor class. Most of the areas of highly unhygienic surroundings and were of poor socio - economic status.

#### INCIDENCE OF EYE AFFECTION -

The affection of the left eye (58.06%) is dominating over the right eye (41.94%) as observed in present series, which is in agreement with other observers i.e. Veris (1955) as 66% in left and 34% in right eye, Sood et al (1967) as 50% in each eye, Malik S.R.K. et al (1969) as 58.8% in left and 41.2% in right eye and Bale R.N. (1987) as 51.04% in left eye and 48.94% of right eye.

Bilaterality was found, by Degliesh (1967) as 66% unilateral and 34% bilateral, by Malik S.R.K.



et al (1969) as 74% unilateral and 26% bilateral and by Bale R.N. (1987) as 57% unilateral and 43% bilateral. In this series it was 76% unilateral and 24% bilateral, which is more or less in agreement with earlier observers.

#### CLINICAL FEATURES -

In our study, the epiphora was the most commoner symptom (95.16%). The second common symptom was regurgitation of fluid or mucopurulent discharge along with epiphora while pressing the sac region (75.80%).

These same findings were also observed by Reddy et al (1955), Chatterjee (1955), Jones L.T. (1957), Jacobb H.G. (1959), Malik S.R.K. (1969) and Bale R.N. (1987).

#### PATENCY FACTOR -

In all the cases, syringing was done and 92% cases showed complete blockage of lacrimal passage i.e. saline regurgitate from upper puncta. In one case the lacrimal passage was found be partially blocked, that case was of mucocoele. In three cases which were of chronic lacrimal fistula, the saline peeps out through fistula which also indicates the blockage of the drainage system of lacrimal apparatus below the level of fistula.

The regurgitation of saline from upper puncta in syringing test shows the definitive obstruction of drainage channel at various level.

BACTERIOLOGY -

The direct inoculation on blood agar media had been helpful in preventing the total or partial damage to the organism by dissication during transportation and storage. Hence more promising results were obtained. The absolutely sterile material and methods used helped to minimise the chances of contamination, only those organism grown within the inoculated area were taken into consideration.

The bacterial flora of chronic dacryocystitis cases had been studied by several authors and number of organism have been isolated.

In the present series three cultures of each eye (one from conjunctival sac, one from lacrimal sac discharge and one from nasal mucosa) have been done. So total 186 culture reports has been found in which 126 (67.75%) showed growth of some organism i.e. positive culture report. Whereas 60 (32.25%) did not show any growth i.e. sterile culture report.

This figure is agreement with the other authors i.e. Rollet and Bussy found 26% sterile culture in their series while Reddy and Reddy observed 15% sterile and Bale R.N. found 35.43% sterile.

Out of these 126 positive culture 109 reports were found in pure form (single organism) and remaining 17 culture reports were in mixed form (more than one organism present in one culture).

Other authors were also found the mixed flora i.e. Rollet and Bussy, Reddy and Reddy, Ram and Prasad Gutierrez E.H. and Bale R.N.

In the present series of study the staphylococcus epidermis was found to be the commonest organism (20.43%) and second common organism was the pneumococcus (8.06%). Other organism in order of their frequency were found i.e. straptococcus viridans, Str. pyogenes, staph. aureus, E. Coli, Klebsiella, Str. Bete hemolytic, diphtheria, pseudomonas. These were more or less in accordance with findings of Reddy and Reddy (1955) and Ram and Prasad (1958). Order of frequency in their series was staphylococcus, pneumococcus, streptococcus, diphtheria etc.

Rollet and Bussy (1923) also found staphylococcus as dominating organism as the same manner and Gutierrez E.H. (1972) observed staphylococcus was a most dominating organism, found in 51% cases and pneumococcus was the second common organism found only in 8% of cases.

Pneumococcus had been found to be commonest organism causing this disease as observed by Duke Elder (1952), occurs in pure form or associated with other organism both in acute as well as in chronic form. Other organisms, which were found by him to be responsible for the disease, according to their frequency were staphylococcus, streptococcus, diphtheria, friedlanders bacillus and so on.

Bale R.N. (1987) observed that the pneumococcus and C - ve staphylococcus were equally responsible for the dacryocystitis 17.94% and 17.01% respectively. Other organism he was found according to their order of frequency i.e. C + ve staphylococcus, N. catarrhalis, pseudomonas, straptococcus, proteus, E.Coli, Klebsiella, candida and B. subtilis.



#### GROWTH OF ORGANISM FROM CONJUNCTIVAL SAC -

In our study, out of 62 cultures of conjunctival sac 34 were found positive and 28 (48.16%) were sterile. Amongst 34 positive culture reports 28 were found in pure form (single organism) and remaining 6 were mixed organism (more than one organism in single culture). In out of these 28 culture reports the staphylococcus epidermis was found as a dominating organism i.e. 12 eyes (19.35%). It is agreement with other observers like - Seal et al (1982) reported 80% positive culture and 20% sterile and in positive culture 1.5% found mixed and remaining 78.5% pure culture. Staphylococcus epidermis was the dominating organism 39%. Bale R.N. (1987) observed the sterile culture in 48.95% and out of these 51.05% positive culture he found 0.69% mixed and remaining 50.36% were pure culture. Most common organism in his series was C - ve staphylococcus 15.38%.

#### GROWTH OF ORGANISM FROM LACRIMAL SAC -

In present study the culture report of 62 eyes (20) 32.25% found sterile and growth of organism was observed in (42) 67.74%. Out of these 42 positive culture 36 reports showed growth of single organism and remaining six showed mixed growth.

*Staphylococcus epidermis* found the maximum i.e. 10 eyes (16.12%) amongst all the culture reports (62); followed by *streptococcus pyogenes*, *strep. veridans* and *D. pneumoniae* etc. Other observers found the similarity with our study eg. Gutierrez (1969) in his study found the *staphylococcus aureus* as a very dominating organism in lacrimal sac i.e. 51% of eyes. In 32% of cases he found mixed growth. Whenever Seal et al (1982) found 16% sterile culture and in remaining 84% of positive culture 4% he found mixed and 80% in pure form. *Staphylococcus epidermis* was the commonest organism in his study and percentage of *pneumoniae* was the 10%. While Bale R.N. (1987) observed that the 37.06% sterile and from remaining 63.94% of cases 4.19% cases were found mixed. *D. pneumoniae* found as a commonest organism which was followed by C - ve *staphylococcus* 13.98%.

#### GROWTH OF ORGANISM FROM NASAL MUCOSA -

As compare to conjunctival sac (45.16%) and lacrimal sac (32.05%) nasal mucosa showed only (12 eyes) 19.35% sterile culture reports. Out of these (62 eyes) 80.65% positive culture 8.06% showed mixed growth and remaining 72.59% was in pure form.

*Staphylococcus epidermis* was the dominating organism 25.80% which was followed by *D. pneumoniae*, *staph. aureus* etc. It is the near agreement with other observers eg. Bale R.N. (1987) observed that the 20.29% cases was sterile and remaining 79.71% positive culture. From these positive reports he found 72.74% pure culture and 6.99% mixed C - ve *staphylococcus* was the dominating organism 20.27% which was followed by *D. pneumoniae* 19.58% of eyes.

Emphasis was also given in the present study to find out the relationship between three flora in all the cases. It was observed that the organism growth were common to all the three in 25.80% of cases. The conjunctival and lacrimal sac flora was same in 35.48% as against the lacrimal sac and nasal mucosa, where it was in 14.15% of cases. There had been no correlation between the three flora in 24.19% of cases.

Similar organism were found in nasal mucosa and lacrimal sac discharge in 14.15% of cases so it is very likely that the nasal cavity would be the source of infection in some cases as clinically nasal infection was also found in 6 cases. However, it is very difficult to decide whether the infection was primary or secondary in the sac from surrounding structures.

The pneumococcal infection was unexpectedly low in the present series while the incidence is usually very high in conjunctival sac and nasal cavity (Duke Elder 1952), (Bale R.N. 1987). There is a possibility that the cases of chronic dacryocystitis are due to pneumococcus to begin with secondary bacterial invaders may set in later on and in some cases they may out grow the pneumococcus, which may not be isolated on routine method of culture. In the sterile cases the possibility is that after some period the organism extinguished either due to increased resistance of the patients or by using drugs. This hypothesis not only explains the bacteriology of dacryocystitis but also the relationship seen with the nasal pathology.

Comparative high incidence of staphylococcus may be due to poor personal hygienic habits, these cases were mostly from poor socio - economic status. They were not very particular about cleanliness. The unusual low incidence of streptococcus and pneumococcus may be due to the fact that there are very delicate organisms and do not grow in abnormal conditions. These organisms were also very sensitive to antibiotics which may results in sterility of smear during routine culture.



NASAL PATHOLOGY -

In the present study out of 62 eyes, 13 (20.96%) eyes had nasal pathology and a large portion of 49 (79.03%) had not be any nasal pathology. In these 13 eyes of nasal pathology, 4 eyes were affected by deviated nasal septum (DNS), 5 by inferior turbinate hypertrophy (ITH) and 2 by rhinitis in which one case was having of chronic rhinitis and one was suffering from atrophic rhinitis. Two cases were affected by deviated nasal septum with inferior turbinate hypertrophy. This is more or less in agreement with the other authors i.e. -

Bale R.N. (1987) observed the nasal pathology in 28.6% cases in which DNS in 5.59%, ITH in 6.29% , rhinitis 6.99% and DNS & ITH were in 9.79% of eyes.

The relationship between the flora of lacrimal sac and nasal mucosa of cases with nasal pathology had been also studied and found that out of these 13 cases (had nasal pathology) revealed that in 46.15% (6 cases) of cases there was similarity in the flora from the two sites whereas in 53.85% (17 eyes) cases, there was no correlation between the two. It is also observed by Bale R.N. (1987).

The commonest site of obstruction in lacrimal passage is the junction of the lacrimal sac and the nasolacrimal duct observed 54.8% by Campbell (1964) and 53.2% by Malik S.R.K. et al (1969). Other commonest site of obstruction was the sinus of Maier 24.3% observed by Campbell (1964) and agrees with it Nahata (1964) and Malik et al (1969). Next common sites of obstructions were found at the lower end of canal as observed by Traquair (1941) and Rutz et al (1966). So the following nasal pathology may be the cause of dacryocystitis i.e. -

- Deviated nasal septum - Extreme deviated nasal septum may compress the inferior turbinate against the lateral wall of lower end of nasolacrimal duct of the same side so the duct compress and due to that obstruction may be the cause of dacryocystitis as observed by Bockstein (1926), Kofler (1930) etc.
- Inferior turbinate hypertrophy - Enlargement of inferior turbinate bone may obliterate the anterior part of the meatus leading to local rhinitis and thus obstructing the opening of nasolacrimal duct which may be the cause of dacryocystitis as observed by Post (1928) etc.

- Inflammatory and chronic allergic condition like chronic rhinitis and chr. nasal catarrh may spread the infection to the lower end of nasolacrimal duct which may obstruct the duct and dacryocystitis results, as observed by Duke Elder (1952).
- Atrophic rhinitis may also be the cause of dacryocystitis because of the destruction of the nasal mucosa, permitting the entry of infective secretion of nose into the lower end of nasolacrimal duct as observed by Franceschetti (1935).
- Few authors also claimed that the chronic sinusitis may be the cause of dacryocystitis and few believed that the infection of nose may spread towards lacrimal passage either by venous or lymphatic pathways because of lacunae in continuity between ethmoid bone and lacrimal bone.

SUMMARY AND CONCLUSION



#### SUMMARY AND CONCLUSION

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The present study was conducted in the department of Ophthalmology at M.L.B. Medical College and Hospital, Jhansi for bacteriological study (of chronic dacryocystitis) and its relation with nasal pathology in the patients of chronic dacryocystitis. The study was done in 50 cases (62 eyes), which were suffering from different types of chronic dacryocystitis. We come to the following conclusions :

- (1) The incidence of chronic dacryocystitis was very high as compared to other types i.e. chronic lacrimal fistula and mucocele etc.
- (2) Patient of 4th and 5th decade of life were most commonly affected, probably because of excessive lacrimation and relative insufficiency of drainage passage at this age.
- (3). Females were more predominantly affected than the male. It is due to many reasons i.e. narrow nasolacrimal canal, dust and smoke during cooking, uses of cosmetics, weeping due to excess emotions, less blowing of nose etc.

- (4) The incidence of the disease was more common in people of poor socio - economic status with unhygienic surroundings.
- (5) Chronic dacryocystitis is common in left eye and one fourth number of the cases were found bilateral.
- (6) In almost all the cases, the epiphora was the most common symptom followed by regurgitation of fluid by pressure over the sac area.
- (7) During syringing the regurgitation of injected saline from upper puncta of the same eye, suggested the obstruction in the drainage channel at various level.
- (8) In bacteriological study the staphylococcus was common as compare to streptococcus and pneumococcus.
- (9) Mixed organism infection is not uncommon in all the three sites eg. conjunctival sac, lacrimal sac discharge and nasal mucosa.

- (10) In comparative study of bacterial growth, we found a net similarity in 38 eyes of conjunctival sac and lacrimal sac. Whereas the similarity in lacrimal sac and nasal mucosa was found only in 24 eyes. (Total eyes are 62).

Thus it concluded that the conjunctival affection in dacryocystitis is more common rather than the affection of nasal mucosa. It is due to fact that the high incidence may be attributed to the common habitat of two and the easy communication of conjunctival sac and lacrimal sac through punctum.

- (11) The incidence of nasal pathology was found only in 13 eyes out of 62, which included deviated nasal septum, inferior turbinate hypertrophy, rhinitis and deviated nasal septum with inferior turbinate hypertrophy. These conditions may compress the lateral wall of lower end of nasolacrimal canal and may be responsible for dacryocystitis. But the incidence of nasal pathology in dacryocystitis patient is very low (only 20.96%).

- (12) A further step was taken to verify the relationship between the lacrimal sac and nostril flora in 13 cases of dacryocystitis with nasal pathology. The study of bacterial flora of these two sites revealed that in 6 cases (41.15%), there was similarity, whereas in 7 cases (53.85%), there was no correlation of two floras (out of 62 cases). So it can be said that there are only about 50% chances of getting a involvement of lacrimal sac by nasal pathology.
- (13) There is significant correlation between conjunctival sac and lacrimal sac bacteriologically compared to nasal pathology.



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APPENDIX - I

DEPARTMENT OF OPHTHALMOLOGY, M.L.B. MEDICAL COLLEGE  
AND HOSPITAL, JHANSI (U.P.)

PROFORMA FOR EXAMINATION

<u>Case No.</u>	<u>Details of patient</u>
1. Name of Investigator : Dr. M.C. Agarwal	1. Name :
2. Surgeon I/c :	2. Age/sex.....Wd/bed...
3. Place :	3. Address :
Date :	4. Occupation :

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A. Presenting symptoms :

- 1.
- 2.
- 3.
- 4.
- 5.

B. A brief history of present illness :

C. Past History : H/o Diabetes, Tuberculosis, Leprosy,  
Siphilis, Hypertension etc., Any  
Operation of eye.

D. Family History :



EXAMINATION: (General)

- Pulse
- Respiratory rate
- Blood pressure
- Temperature
- Lymph nodes

EXAMINATION: (Systemic)

- CVS
- + Respiratory system
- C.N.S.
- G.I.T.
- Genito Urinary system

EXAMINATION OF EYE :

A. LOCAL EXAMINATION OF EYE: (Routine)

( By the help of Torch )

1. - Facial

Rt.

Lt.

- Symmetry
- Eye brows
- Eye lashes
- Eye lids

- |                    | Rt. | Lt. |
|--------------------|-----|-----|
| 2. - Cornea        |     |     |
| - Anterior chamber |     |     |
| - Iris             |     |     |
| - Pupil            |     |     |
| - Lens             |     |     |
| - Visual           |     |     |
| - Aquity           |     |     |
| - Fundoscopy       |     |     |
| - Tonometary       |     |     |

B. SPECIFIC EXAMINATION :

- |                       | Rt. | Lt. |
|-----------------------|-----|-----|
| 1. <u>Conjunctiva</u> |     |     |
| - Bulbar              |     |     |
| - Limbal              |     |     |
| - Palpebral           |     |     |
| - Intermarginal strip |     |     |

2. Lacrimal system :

- |                         | Rt. | Lt. |
|-------------------------|-----|-----|
| - Sign. of inflammation |     |     |
| - Discharge on pressure |     |     |
| - Sac syringing         |     |     |
| - Others                |     |     |

## EXAMINATION OF NOSE AND PARANASAL SINUSES

### (A). EXTERNAL EXAMINATION :

- (I) - Nasal pyramid - Bony
  - Cartilleginous
- (II)- Nasofacial groove -
- (III)- Nasolabial groove -

### (B). ANTERIOR RHINOSCOPY :

- (I)- Without Nasal Speculum -
- (II)- With Nasal Speculum :
  - Septum -
  - Lat. nasal wall -
  - Turbinates : Middle -
    - Inferior -
  - Colour of mucosa -
  - Discharge -
  - Inferior meatus -
  - Middle meatus -
  - Spuriior meatus -

### (C). MEDIAN RHINOSCOPY :

(D). POSTERIOR RHINOSCOPY :

Post. end of - Middle Turbinate  
- Middle meatus  
- Inferior Turbinate  
- Inferior meatus  
  
Nasopharynx. -

(E). RADIOLOGICAL EXAMINATION FOR NASAL DISEASE :

INVESTIGATIONS :

1. BACTERIOLOGICAL EXAMINATION - Culture of  
Conjunctival sac, lacrimal sac, Discharge  
and Nasal Mucosa Swabs:

	Conjunctival sac	Lacrimal sac	Nasal mucosa
Name of Organism			
Total			

2. ROUTINE EXAMINATION :

(A). Blood -  
(B). Urine -